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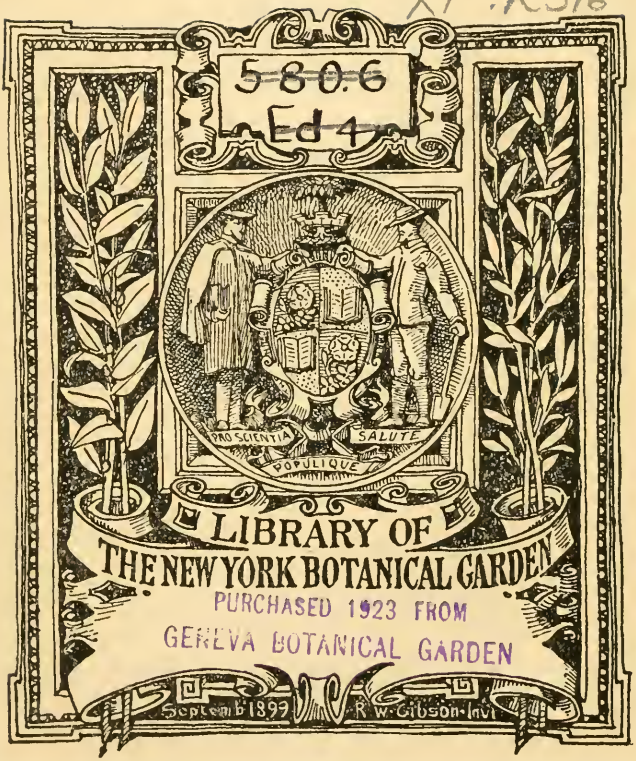

DUPLICATA DE LA BIBLIOTHÈQUE
DU CONSERVATOIRE BOTANIQUE DE GENEVE
VENDU EN 1922

TRANSACTIONS AND PROCEEDINGS

OF THE

BOTANICAL SOCIETY.

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Along with the 2nd Part of "Hepaticæ Amazonicæ et Andinæ," completing the work, will be issued a short Introduction, mainly geographical, a Synopsis of the genera, an Index, and the remainder of the Plates, about 16 in number.

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HEPATICÆ AMAZONICÆ ET ANDINÆ

QUAS

IN ITINERE SUO PER TRACTUS MONTIUM ET FLUVIORUM

AMERICÆ ÆQUINOCTIALIS

A FLUMINIS AMAZONUM OSTIIS AD MARIS PACIFICI LITORA
USQUE, NECNON A CATARACTIS FLUMINIS ORINOCI,
CIS ÆQUATOREM, ADUSQUE FLUVII HUALLAGA
CATARACTAS, LAT. 6°—7° AUSTRALI,

ANNIS 1849—1862,

DECERPSIT NUPERIUSQUE DESCRIPSIT

RICHARD SPRUCE.

CONSPECTUS HEPATICARUM

SUBORDINUM, TRIBUUM ET SUBTRIBUUM.

NEW YORK BOTANICAL GARDEN

Subordo I. JUNGERMANIACEÆ.*

Vegetatio foliosa, in perpaucis frondosa. *Fructus solitarius pedicellatus capsularis quadrivalvis*, rarissime irregulariter ruptus. *Elateres* sporis interjecti. *Andrœcia* spicata, sæpe amentiformia; antheridia bracteis foliaceis suffulta, solum in paucis frondosis in caule sparsa vel seriata et ebracteata.—p. 1–556.

Tribus I. *JUBULEÆ.*

Ramificatio ubique lateralis, scilicet ramis distichis, foliis solum lateralibus (nunquam posticis) adjectis, in plerisque infra-axillaribus. *Folia semper alterna, incuba, complicato-biloba, lobulo inferiore minore vulgo inflato vel saccato. Foliola*, sive folia postica, in omnibus ferme præsentia, radicellifera; in paucis nulla (radicellis in tali re in caule biseriatis); in paucissimis duplicata (i.e. biseriata). *Flores* ♂ sæpius diandri, in paucis monandri, solum in *Myriocolea* 4–7-andri. *Flores* ♀ *monogyni, vel* 1–4-*gyni. Perianthium* semper præsens, liberum, a fronte plus minus compressum, 2–12-angulatum, raro teres, apice constricto breviter tubulare. *Calyptra* tam a perianthio quam a pistillidiis constanter libera. *Capsula* brevipes globosa, *ab apice ad* ⅔ *solum* 4-*valvis, tertiâ parte inferiore solidâ*, collum sive apophysin (revera pedicelli apicem dilatatum) sistente. *Elateres monospiri, truncati, persistentes.*—p. 1–308.

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Tribus II. *JUNGERMANIEÆ.*

Ramificatio varia, lateralis, vel ex parte (quoad ramulos floriferos præcipue) postica; raro omnes rami postici, rarissime alii etiam antici.

* Caracteres literis italicis impressi majoris momenti sunt.

Folia in aliis incuba vel transversa, in aliis succuba, alterna vel opposita, forma valde varia, plerumque subexplanata vel concava, integra vel persæpe fissa, rarius autem complicato-biloba. *Foliola* aliorum generum constanter præsentia, aliorum perrara nullave. *Flores* ♂ in aliis semper monandri, in aliis oligandri, in perpaucis polyandri. *Flores* ♀ *oligo-polygyni; pistillidia* 5–80, libera, vel in fructu calyptræ plus minus alte adnata. *Perianthium* valde varium, complanatum, trigonum vel polygonum, raro perfecte teres, ore hiante vel constricto; interdum plane vel ad speciem deficiens; in paucis marsupium carnosum pendulum sistens. *Calyptra* utplurimum libera, in aliis autem perianthio vel involucro adnata. *Capsula globosa, oblonga vel cylindrica, ad basin usque* 4*-valvis*, in paucissimis irregulariter dehiscens. *Elateres in omnibus fere dispiri, raro monospiri vel* 3–4*-spiri, decidui*, perpauci heteromorphi interdum in capsulæ fundo apiceve diutius persistentes, demum idem ac normales decidui.—p. 309–556.

A. *Elateres normaliter dispiri.*

a. *Radicellæ e foliorum lobulo ortæ.*

Subtribus I. Radulæ. *Plantæ* grandiusculæ, prostratæ, dichotomæ vel laxe pinnatæ. *Rami omnes laterales, infra-axillares. Folia* iucuba, complicato-biloba, lobulo inferiore minore rhizophoro. *Foliola nulla. Flores* ♂ 1–3-andri. *Perianthium a fronte semper fere compressum*, interdum complanatum, *ore lato truncato. Capsula* tantum non omnium oblongo-cylindrica.—p. 313–325.

b. *Radicellæ e caule vel e foliolis posticis ortæ.*

Subtribus II. Porellæ. *Plantæ* elatæ speciosæ. *Caules* e caudice repente radicelloso orti plumæformi-pinnati vel bipinnati, subarhizi, *ramis omnibus lateralibus intra-axillaribus.* Folia incuba complicato-biloba, lobulo inferiore sat minore ligulato. *Foliola lobulis æquimagna*, subinde rhizophora. *Flores* dioici: ♂ constanter monandri. *Flores* ♀ in ramulo laterali valde abbreviato terminales (i.e. *cladogeni*). *Perianthium* a fronte compressulum, trigonum, angulo tertio postico, 3–10-plicatum, *ore laciniolato primum constricto demum hiante vel bilabiato.* Calyptra libera. *Capsula* magna globosa, ad basin usque 4-valvis; *valvulis sæpe basin versus incomplete disjunctis, irregulariter fissis.*—p. 325–334.

Subtribus III. Ptilidiæ. *Plantæ* pro more elatæ, sæpe pulchre colorata,

albidæ, flavicantes roseæve, interdum sanguineæ. *Caules* plerumque e caudice repente radicelloso, sæpe etiam flagellifero, orti, pinnatim vel vage ramosi subarbizi ; rami vel omnes laterales vel alii postici, *flore* ♀ *autem semper in caule vel in ramo laterali* (*nunquam postico*) *longiore brevioreve terminali. Folia* incuba, transversa, vel succuba, *foliolis* (*semper præsentibus*) *subæquimagna atque conformia*, canaliculata, rarissime autem complicata, *bi-plurifida*, sæpe eleganter ciliata, vel in lacinias capillares dissoluta. *Florescentia* in omnibus (*Anthelia Juratzkana* sola excepta?) dioica. *Flores* ♂ in succubifoliis monandri, in incubifoliis utplurimum diandri. *Bracteæ* ♀ plurijugæ, vel omnes liberæ, vel intimæ perianthio—interdum calyptræ—adnatæ. *Perianthium* (ubi adest) a fronte parum vel vix compressum, carinis plicisve 3–10 percursum, raro ecarinatum, ore constrictum vel truncatum, a bracteis intimis liberum vel in aliis generibus iisdem adnatum et obvelatum ; interdum nullum. *Calyptra* libera, vel in aliis speciebus eperiantheriferis bracteis internis vestita. *Capsula* vel globosa valida pluristrata rectivalvis, vel cylindracea bistrata tortivalvis, valvulis interdum bifidis. *Elateres* tenues dispiri.—p. 335–351.

Subtribus IV. Trigonantheæ. *Plantæ* pusillæ vel elatiores, e viridi pallescentes, raro luridæ vel subroseæ. *Caules* sæpius prostrati vel procumbentes, vage vel pinnatim ramosi, aut dichotomi, flagellis posticis subaphyllis sæpe adjectis. *Rami* foliosi laterales, vel alii—interdum omnes—postici ; *floriferi* ♀ *tantum non in omnibus postici* solum in paucis *Cephaloziis* terminales ; in *Anomoclada* autem rami tam foliosi quam floriferi omnes antici. *Folia* alterna, raro opposita, succuba vel incuba, forma varia, *ab apice—sæpe lato, truncato—plus minus profunde* 2–4-(*raro ad* 6-) *dentata-lobatave*, raro perfect integra ; in perpaucis complicata (lobulo postico minore) ; *margine* utplurimum integerrimo *plano vel incurvo* (*nunquam recurvo*). *Foliola* vel nulla vel parva ; raro foliis haud multo minora iisdemque subconformia. *Flores ramulo postico constantes ;* vel (rarius tamen) in ramo laterali vel in ipso caule terminales, ♂ monandri, rarissime diandri. *Bracteæ* ♀ plerumque trijugæ et tristichæ, in paucis distichæ. *Perianthium* semper fere elongatum et angustum, trigonum, angulo tertio postico, raro ex angulis intercalatis 4–6-gonum, omnibus angulis exalatis et inermibus ; a calyptra et involucro liberum (præter *Anomocladæ* bracteis intimis leviter adnatum, et *Kantiæ* cui marsupium calyptrâ intus concretum perianthii loco adest). *Calyptra* plerumque parva, nisi in Kantia libera. *Capsula* sæpissime oblonga vel cylindrica, bistrata—in paucis generibus 4–5-strata, valvulis rectis, solum in *Kantia* contortis. *Elateres* tenues dispiri.—p. 351–416.

Subtribus V. Scapanioideæ. *Plantæ* speciosæ grandifoliæ, colore roseo

albido, vel flavido sæpe insignes. *Caules* e caudice repente orti, erecti vel devexi, subradicellosi, *ramos paucos solum laterales proferentes. Folia* alterna transversa *complicato-biloba, lobulo antico minore*, margine utplurimum pulchre denticulata ciliatave, interdum etiam lobulata, facie supera nuda vel in aliis lamellosa pilosave. *Foliola* in plurimis nulla, in paucis adsunt sat magna, biloba et incisa. *Flores* in caule terminales, dioici, raro paroici: ♂ di-polyandri. *Bracteæ* ♀ in plerisque foliis subconformes, magis æquilobæ. *Perianthium* in typicis emersum; liberum, *a fronte compressum*, ore truncato sæpe complanatum et decurvum, in aliis paucis minus compressum et 5-pluriplicatum; in genere *Schistocheila* Dum. (= *Gottschea* Nees.) autem nullum proprium, bracteis 3–4-jugis, caulis apici cavo tumenti adnatis, perianthii vicibus fungentibus. *Capsula* valida oblonga, interdum prælonga. Elateres dispiri.—Subtribus melius forsan pro sequentis sectione habenda, habitu autem peculiari et foliis complicatis *lobulo antico minore* (nec postico ac in *Radula*, etc.) facile recognoscenda.—P. 416–419.

Subtribus VI. Epigonianthe.æ. *Plantæ* rarius pusillæ, sæpe elatiores vel robustæ, e viridi albicantes flavidæve, nunc subluridæ, minus frequenter roseæ. *Caules* vel e caudice radicelloso repente assurgentes, tantum non omnes arhizi; vel prostrati et crebrius radicellosi; vage ramosi vel dichotomi, raro pinnati. *Rami* semper fere laterales, e foliorum axilla media posticave orti, rarissime revera postici, i.e. foliolis axillaria. *Folia succuba vel transversa* (*nunquam incuba*) alterna vel opposita, sat lata, integra, bifida vel 3–5-fida; margine in pusillis pro more integerrima, in elatioribus persæpe ciliata vel spinoso-dentata, basi antica sæpe valide recurva. *Foliola* plerumque nulla vel parva, raro majuscula; in aliis speciebus oppositifoliis (e.g. *Lophocoleis*, *Chiloscyphis* et *Leioscyphis*) utrinque cum folio adjacente in verticillum trifolium connata; in *Plagiochilis* oppositifoliis autem nulla. *Flores* dioici vel monoici, *acrogeni*, rarissime hypogeni. *Bracteæ* ♂ 1–10-andræ. *Bracteæ* ♀ 1–5-jugæ, foliis plerumque magis incisæ, liberæ vel in paucis perianthio plus minus alte adnatæ, vel denique perianthii incomplete monophylli vel plane deficientis vicibus fungentes. In generibus quibus marsupium perianthii loco adest bracteæ interiores persæpe minutæ, marsupii os cingentes. *Perianthium perfectum normaliter a latere compressum*, in aliis (superne saltem) complanatum, anceps, apice prælato truncato vel bilabiato, suturis (antico et postico) sæpe alatis, in iis autem quibus adsunt foliola majuscula persæpe *trigonum, angulo tertio antico;* in aliis denique magis inflatum, 3-polygonum, raro teres, microstomum. *Capsula* sæpius plus minus oblongata, pluristrata. *Elateres* di- (rarissime mono-) spiri.—p. 419–523.

Subtribus VII. Fossombronieæ. *Plantæ* foliosæ vel *sæpius frondosæ*, pro more prostratæ, radicellosæ; in *Scalia* autem basi rhizomatosâ ramosâ matrici adfixæ, omnino arhizæ; subdichotomæ, speciebus frondosis rarius postice subramosis. *Caulis* plerumque subplano-convexus, a frondis pagina bene definitus; vel prælatus, cum pagina utrinque confusus. *Folia* (ubi adsunt) succuba, sat lata, sæpe carnosula, siccando flaccida. *Foliola*, præter in *Scalia*, nulla. *Frondes* lineares vel obovatæ, integerrimæ vel serrulatæ, interdum pinnatifidæ, in *Petalophyllo* supra lamellosæ. *Flores* ♂ *in caulis tota longitudine submarginales; antheridia* 2–5*na, foliis vix velata; in aliis tam foliosis quam frondosis in alveolis epidermidi opertis, utroque caulis latere ordinatis,* 2–3*na; vel* (*in aliis*) *alveolis apertis monandris bractea minuta incurva suffultis recepta. Perianthium* incomplete (solum in *Pallavicinia* perfecte) tubulare; in multis autem nullum adest. *Calyptra* raro parva, plerumque elongata carnosa, ab involucro et perianthio libera, receptaculo autem sæpe plus minus alte concreta. *Pistillida* sterilia vel calyptræ plus minus alte (interdum solo apici) adnata, vel super caulem seriata, nuda. *Capsula in* Typicis *subglobosa*, 2–5-*strata, plus minus irregulariter dehiscens*; *in* § Leptotheceis *cylindracea*, 1-*strata valvulis* 4, *regularibus, vel solum uno latere dehiscens. Elateres* 2–4-(raro 1-) spiri, omnes simul, vel alii paulo tardius decidui.—P. 523–539.

b. Elateres monospiri, utroque fine acutissimi; pauci autem apicales breves rigidi diutius persistentes.

Subtribus VIII. Metzgerieæ. *Plantæ frondosæ*, dichotomæ vel pinnatim ramosæ, laciniis linearibus; rami in altero genere (*Aneura*) omnes laterales, costa lata laxius cellulosa subtus radicellosa, pagina nulla vel perangusta, raro sat lata; in altero generi (*Metzgeria*) rami rarissime laterales et pinnati, floriferi omnes (interdum etiam efloriferi) postici, radicellis e costa margineque, subinde etiam e tota superficie ortis. *Genitalia utriusque sexus in ramuli abbreviati costâ disticha; pistillidia* 2–20-*juga, astyla*; *antheridia sæpius magis numerosa, rarissime* 4-*sticha. Perianthium nullum. Calyptra magna clavata, carnosa, in* Aneura *sæpius papillosa, in* Metzgeria *radicellis hirta. Capsula* elongata, ad basin usque 4-valvis, bistrata. *Elateres apicales fixi, cum cæteris liberis intexti, in penicillos quatuor supra capsulam apertam porrecti.*—p. 539–556.

Subordo II. MARCHANTIACEÆ.

Frondes plus minus carnosæ, prostratæ, late et indistincte costatæ, *supra venoso-areolatæ, areolis pro more uniporosis*, strato hypoporo

cavernoso ; dichotomæ, interdum frondulas posticas edentes ; subtus radicellis prælongis villosæ, *inter radicellas paleis seriatis coloratis plerumque ornatæ*. *Ductuli hydragogi* capillacei longissimi fasciculati canalem subter costam implentes, deinde per pedunculi canaliculos ad capitulum usque ascendentes. *Flores* in omnibus fere dioici, acrogeni vel epigeni. *Andrœcia vel peltata stipitata vel discoidea subimmersa ; antheridia* in alveolis solitaria. *Capitula* ♀ *pedunculo valido cum frondis costa continuo suffulta*, 2-*multiflora*, orbiculata, hemisphærica vel conoidea, plerumque lobata, subtus paleacea, intus locellata, locellis deorsum spectantibus. *Involucrum* cujusque locelli uni-pluriflorum vel nullum. *Perianthium* devexum tenerum. æqualiter fissum, raro nullum. *Pistillidia* 2–12, in toro brevi biseriata. *Calyptra* tenuis, basi sola sæpe persistente. *Capsula brevipes, globosa, unistrata, circumscissa, vel a vertice* 4–8-*fida*. *Elateres* 1-5-spiri decidui.—p. 556–560.

Subordo III. RICCIACEÆ.

Frondes cellulosæ carnosæ, strato cavitatum aërearum sub epidermide prædítæ, utplurimum dichotomæ. *Fructus evalvis, fronde plerumque immersus. Involucrum* sæpissime, *perianthium* semper, nullum. *Capsula* vel libera vel calyptrâ connata et confusa, globosa, *irregulariter dehiscens. Elateres* nulli. *Antheridia* fronde immersa. p. 569–571.

Subordo IV. ANTHOCEROTACEÆ.

Frondes molles, carnosulæ vel tenues, siccando flaccidæ, subtus radicellosæ epaleaceæ ; orbiculares, ambitu lobatæ, costa prælata cum pagina confusa ; in *Dendrocerote* autem pinnatim fissæ, lineares, costa angusta bene definita. *Epidermis eporosa*, interdum cellulis gonidiiferis opacis punctata. *Flores* monoici vel dioici, antici (i.e. epigeni). *Antheridia* in alveolis supra frondem sparsis immersa, obtecta, solitaria vel pauca, raro plurima. *Involucrum* corniforme, ore obliquo scarioso. *Perianthium* et *calyptra nulla. Oögonia solitaria nuda*, intra costæ substantiam nidulantia. *Fructus* pedunculatus, *siliquæformis, bivalvis, columellâ* (*sive dissepimento*) *percursus*

Elateres vel monospiri vel fibram solum flexuosam (nec spiralem) continentes.—p. 571–578.*

* Synopses of the Genera in each Suborder, Tribe, or Subtribe, and of the Species in each Genus, will be found in their proper place in the body of the work.

For an exposition of the principles on which this classification of Hepaticæ is based, see the author's memoir "On *Cephalozia*" (Malton, 1882).

"Hepaticæ Amazonicæ et Andinæ."

Part I. (pp. 1–308) published April, 1884.

Part II. (pp. 309–588) published November, 1885.

HEPATICÆ AMAZONICÆ ET ANDINÆ.

Ordo *HEPATICÆ.*

Subordo I.—*JUNGERMANIACEÆ.*

Jungermanieæ, Nees, Hep. Eur. IV. p. xix.; G. L. et N. Syn. Hep. p. i.

Fructus solitarius, capsularis, quadrivalvis, valvulis interdum fissis, rarissime lacerus. Elateres sporis interjecti. Vegetatio aut foliosa aut frondosa.

Tribus I.—*JUBULEÆ*, Dum. emend.

Jubuleæ, Dum. Comm. bot. et *Lejeuniaceæ*, Dum. Syll. ex p.; *Jubuleæ*, Nees Hep. Eur. III.; G. L. et N. Syn. Hep. 283.

Plantæ elatæ vel pusillæ, interdum minutissimæ, plerumque depresso-cæspitosæ pendulæve, colore virente, albido, rufescente vel badio, raro roseo sanguineove, vix unquam aureo. Caules pinnatim ramosi, vel ex parte dichotomi; rami omnes distichi, laterales, nullo postico. *Folia* constanter alterna, incuba vel transversa, subtus lobulata, lobulo rarius subplano, plerumque inflato vel saccato, interdum bifido, subinde obsoleto, rarissime omnino deficiente. *Foliola postica* (sive *stipulæ*) in omnibus fere præsentia, in paucis nulla, in perpaucis duplicata. *Florescentia* dioica vel monoica (autoica, raro paroica). *Andræcia* spicata, persæpe ramulo proprio amentiformi constantia; bracteæ subæquilobæ diandræ, rarius 1-vel 3–4-andræ. *Gynæcia* in ramo longitudine normali, vel plus minus abbreviato, raro in ipso caule, terminalia. *Involucrum* ♀ bracteis 1–plurijugis, foliis difformibus, planilobulis, constans. *Pistillidia* 1–4, longistyla. *Perianthium* liberum, a fronte plus minus compressum, 2–12-carinatum, carinis plerumque 3 (tertia postica) vel

4–6, raro pluribus (10–12); in paucis speciebus teres (carinis obliteratis), in paucissimis compresso-planum; apice in mucronem tubularem abiens, demum valvatim fissum. *Calyptra* libera, in *Lejunea* tenuis, in *Frullania* carnosa, obovata pyriformisve, apice subregulariter bi-trivalvatim rupta. *Pedicellus* perbrevis, perianthium 2–3plo (interdum vix) superans, apice in capsulam abrupte dilatatus. *Capsula* globosa, pro more tenuis, a media basi ad $\frac{1}{3}$ semicircumferentiæ usque integra, intus pallida, deinde 4-valvis, valvulis ovali-lanceolatis acutis, alternis subangustioribus, facie interna rufescentibus papilloso-spongiosis; cellulæ exteriores sat magnæ et crassæ, tesselatæ, pariete ad angulos vel solum ad latera (per intervalla) incrassato, interiores minus regulares, valde inæqualiter papilloso-prominulæ, intus fibris maculisve coloratis (helicis reliquiis?) reticulatæ. *Elateres* haud numerosi (16–200), capsulæ dimidio supero adfixi, anguste tubæformes, stricti, persistentes, primum omnes deversi apiceque dilatato-truncato capsulæ basi insidentes, mediæ longiores exacte verticales, laterales sensim breviores et subobliqui, omnes unispiri, rarissimo casu, helice fisso, pro parte 2–4-spiri. *Sporæ* majusculæ, globosæ, pressione mutua sæpe polyhædræ, semper fere scaberulæ, tuberculatæ vel verruculosæ. *Propagula*, ubi adsunt, majuscula, disciformia, cellulosa.

CONSPECTUS GENERUM JUBULEARUM.

A. *Lobulus foliorum a caule plus minus dissitus, plerumque saccatus galeatusve, interdum evolutus et recurvo-canaliculatus.*

I. FRULLANIA.—Rami intra-axillares, folii caulini basi *interna* contigui, ab eodem liberi. Folia subtransversa, valida, pro m. integerrima; cellulæ pariete incrassato, trigonis angularibus sat magnis. Foliola constanter præsentia. Innovatio subfloralis nulla. Flores ♀ 2–4-gyni, bracteis plurijugis. Pedicellus cellulis 4-stratis concentricis (8 c. in sectionis diametro, 32 c. in circumferentia) subæqualibus *alternis* conflatus. Capsula facie interna papilloso-spongiosa.

II. JUBULA.—Rami laterales, folio unilobo, *antico*, ex p. in caule, ex p. in ipso ramo insidente, suffulti. Folia super caulem incurrentia, tenella, ciliata, cellulis subleptodermibus conflata. Foliola præsentia. Flores ♀ 1–4-gyni. Innovationes subflorales duæ, oppositæ, altera earum raro deficiente. Bracteæ unijugæ, utraque innovationi ejusdem lateris adnata. Pedicellus cellulis oppositis bistratis, axialibus 4-seriatis, sectione cruciatis ⊕, peripherici 16-seriatis minoribus, constans. Capsula facie interna sublævis, ad speciem porosa.

B. *Lobulus super caulem incurrens (idem ac lobus), incurvo-inflatus vel subplanus, interdum obsoletus.*

III. LEJEUNEA.—Rami *infra-axillares*, folii caulini basi externa con-

tigüi. Folia oblique vel fere longitudinaliter inserta, plerumque tenera, integerrima, denticulata, vel dentato-ciliata. Foliola in plurimis speciebus obvia, in paucis nulla. Flores ♀ monogyni. Innovatis pes subflorales, solitariæ, vel binæ et oppositæ, in plerisque adsunt, bracteis intimis adnatæ, in aliis autem carent. Bracteæ uni-raro pluri-jugæ, planilobæ. Pedicellus idem fere *Jubulæ*, cellulis axialibus 4-seriatis (interstitiis formam crucis ostendentibus), peripherici 12- vel 16-seriatis. Capsula (pro more pallida) facie interna spongiosa.

I. FRULLANIA, Raddi.

Jungermaniogr. Etrusc. (1820); Nees, Hep. Eur. III.; G. L. et N. Syn. Hep. 408.

Plantæ pro more elatæ, raro pusillæ, depresso-cæspitosæ et stratificatæ, sæpe pendulæ, firmiusculæ, colore raro viridi, plerumque rufescente badiove, interdum fere nigro, in paucis roseo tincto vel omnino sanguineo, haud raro nitido. *Caules* validi teretes opaci, cellulis parvis conformibus pluristratis conflati, pinnatim ramosi; rami foliis exacte axillares, basi tam lobo quam lobulo contigui, raro apice bifurci, altero ramulo ad involucrum ♀ abbreviato, altero interdum apice iterum (subinde iterumque) florifero; innovatio vero subfloralis nunquam adest. *Folia* basi brevi transversâ (antice perpaulo sursum vergente) inserta, complicato-biloba; lobus anticus major, oblique ovatus vel suborbiculatus—nunquam angustus—convexus, incubus, persæpi basi antica semicordatus, integerrimus, rarius apice denticulatus; lobulus cucullatus, galeiformis, vel saccatus (campanulatus digitiformisve), haud raro evolutus ovato-lanceolatus, revera pro more bipartitus, lacinia intima (juxta caulem) parva minutave, triangulari, subulata styliformive. *Cellulæ* plerumque parvulæ, in aliis minutæ, in paucis mediocres, in nullis magnæ, in omnibus fere subæquales, globoso-hexagonæ, pariete incrassato, trigonis ad angulos, interdumque (cellularum inferiorum) quoque ad latera, conspicuis. *Folium axillare* (sc. ramorum insertionem obvelans) quoad lobum cæteris foliis conforme, lobulo autem majore, distincte duplice, bifido vel ad basin usque partito, laciniis subæqualibus vel caulinari imo majore. *Foliola* semper præsentia, sat magna, foliis tamen minora, orbiculata, oblonga, vel cuneata, basi sæpe cordata vel crispato-auriculata, raro subdecurrentia, apice bifida (in perpaucis integra), e tergo radicellas breviusculas stellatim patulas rarius proferentia. *Flores* dioici vel monoici (raro paroici). *Andræcia* varie posita, sæpissime ramulo abbreviato, globoso, oblongo vel cylindraceo constantia; bracteæ confertæ, 2- (raro 3-4-)andræ. *Gynæcia* semper terminalia, acrogena vel cladogena. *Bracteæ* 2–5-

jugæ, foliis majores, lobulo majore et evoluto, sæpe dentatæ laciniatæve, intimæ in aliis speciebus in cyathum altum, angulatum connatæ. *Perianthia* semper fere emersa, trigona, angulo tertio postico, vel tetragona, angulis posticis binis; facie antica convexa medio sæpe sulcata, in aliis unicarinata, interdum—in subgenere *Chonanthelia*, rarissime in aliis—e plicis interpositis pluriplicata-carinatave, in omnibus fere lævissima, in perpaucis tuberculis squamulisve conspersa; apice in rostellum tubulare (clausum) absuntia, demum valvatim 2–6-fida. *Pistillidia* 2–4na, longistyla. *Calyptra* pyriformis obovatave carnosa, inferne sæpe 6–8 cellulas crassa, apice dehiscente bi-triloba. *Pedicellus* brevis, perianthio 2–3plo (vel vix) longior, validus, teres, siccando haud articulatus, cellulis breviuscule prismaticis, *alternis* (nec oppositis ad *Lejeuneæ* instar), in pedicelli diametro 8, sectione transversa hexagonis, nisi peripheriçis (sub 32-seriatis) subquadratis et paulo minoribus; pedicellus autem apice abrupte dilatatus, diametro 16 pluresve cellulas constans, sectione verticali semilunata, in capsulam transit.* *Capsula* globosa (ac in tribus diagnosi jam descripta) validiuscula, rufo-badia, 4-valvis. *Elateres* validi unispiri, casu rarissimo 2–4-spiri, in aliis speciebus 30–36 cujusque valvulæ, in aliis pauciores. *Sporæ* sat magnæ, rufæ, tuberculis verruculisve asperulæ.

Obs. The leaves of *Frullania* stand on a very small base, rarely half-embracing the stem, and are almost exactly transverse, their actual insertion being on the intersection of a nearly horizontal plane—trending slightly upwards in front—with the stem, placed vertically. There is no decurrence (or rather incurrence, from the fold upwards) of both lobe and lobule, which is an almost constant feature in *Lejeunea*. The postical lobule, folded in on the incubous lobe, and the auricle of the semicordate base which exists in most of the species, are quite free from the stem. The lobule in a good many of the species is nearly always bifid, having between the "lobule" (usually so-called, which is normally galeate, or saccate, and sufficiently large and conspicuous) and the stem a small plane process (interlobule or "stylus") of a subulate or triangular form.†

* Pedicellus vix unquam e perianthii apice, sed e carina (postica lateralive) infra apicem hiante emergens. Usque fere ad maturationem fructus completam capsula cum suo pedicello (adhuc brevissimo) formam obovato-obconicam monstrat, paulo serius turbinatam pyriformemve; capsulâ autem exserta et dehiscente, pedicellus evenit cylindricus, apice in capsulam globosam dilatatus ibidemque facie supera (sive capsulæ basi interna) concavulus, ambitu quadratus, lateribus suis basin valvularum propriam sistentibus.

† I have sometimes, in accordance with the phrascology hitherto in use, spoken of the antical (or major) lobe as the "leaf," but the minor lobe I always call "the lobule" and not "the auricle," as usually in "Syn. Hep." The latter term is needed for the ear-like dilatation at the antical base of a semicordate leaf, or at both basal angles of the cordate leaf that exists in a few species, chiefly of the subgenus *Meteoriopsis*.

The curious foliaceous disks, orbicular, obovate, or reniform in outline, found attached to the basal margin, or to the underside of the lobule, or sometimes of the underleaves of certain *Frullaniæ Chonantheliæ*, are perhaps to be regarded as propagula, for they quite resemble the marginal propagula occasionally produced (but without any order) on the leaves of many other *Frullaniæ* and *Lejeuneæ*, and they certainly sometimes fall away and develop into separate plants.

The leaf subtending a branch has the ordinary form and position, as to the antical lobe, but the postical lobule is larger, nearly always evolute, and more equally bifid, the segment next the stem being as large as that next the lobe—in *Fr. replicata* indeed much broader and rounder. In some species the segments are separate from each other and from the lobe down to the very base ; but the branch is always exactly axillary to them, touching the *internal* base of both lobe and lobelets at its origin : a character which affords one of the best distinctions from *Lejeunea*, whose branches are uniformly contiguous to the *external* base of the leaf.

Underleaves, or stipules, are constantly present, while in a few species of *Lejeunea* they are altogether absent. They are almost always broad, and at the apex bifid, very rarely entire. Radicles are produced, where needed, from the hilum at the middle base of the underleaf, as in other hepatics ; they are usually short, dark-coloured, and stellately spreading, but are rarely seen except in species of prostrate habit.

The female flowers are mostly acrogenous, but in some species the abbreviated branches bear only involucral leaves, or bracts, and the perianth with its included organs, so that the inflorescence must be considered cladogenous. After reiterated examination I have come to the conclusion that no true subfloral innovation exists in any *Frullania*. The branches that occasionally arise a little below a flower that terminates a stem or branch, are ordinary branches, that would have occupied the same position had the axis from which they spring been prolonged indefinitely instead of determining with the apical flower. Two Andine species, *Fr. flexicaulis*, n. sp., and *Fr. Sabanetica*, G., are notable for such apparently-innovated stems, but in all other *Frullaniæ* known to me they are of only accidental occurrence.

The pistillidia vary in number from 2 to 4. It is doubtful if they are strictly limited to only two in any species, for wherever I have been able to examine a great many young flowers I have almost always succeeded in finding a few, at least, with 4 pistillidia. In the subgenus *Meteoriopsis* the flowers seem normally tetragynous.

The calyptra is fleshy, as much as 6 or 8 cells thick below the middle. I know of but one species, *Fr. leptomitra*, mihi, where it is nowhere more than two cells thick.

In conformity with the usage of preceding authors who have treated of the *Jubuleæ*, I have described the capsule as cloven into 4 valves, down only to a certain distance (about $\frac{2}{3}$ of the semicircumference), but entire at the broad pale fleshy base. It seems, however, more correct to regard this entire portion as the dilated apex of the pedicel, analogous to the *apophysis* of some mosses, by which name we may be allowed to designate it. The pedicel of the *Frullaniæ* is very constantly 8 or 9 cells in diameter and 32 cells in circumference throughout its cylindrical portion, but the degree of dilatation of the apex varies in different species, being 16 or more cells across (on a horizontal tangent to the

concave upper surface of the pedicel, *i.e.*, the inner base of the capsule). The apophysis has therefore the form of a shallow cup, only 2 or 3 cells in thickness where it joins the true base of the valves, but increasing to 6 or 7 cells thick where it coalesces with the cylindrical stalk. The pedicel consists of pale thin-walled cells, which are 6-sided prisms, at first no longer than broad, but stretching out to two or three times the length on the emission of the capsule; and they are *alternate*, so that in drying their ends do not form transverse articulations, as do the collateral and contiguous ends of the opposite cells in the pedicel of *Lejeunea*. The cells of the apophysis are conformable to those of the rest of the pedicel, but undergo no elongation.

The inner face of the capsule is covered with an opaque reddish-brown cell-stratum, very uneven on its surface (papillose, and, as it were, spongy), reaching to the base of the true valves, and ending downwards in a slightly arched line (convex toward the axis of the pedicel), so that the four lines, meeting at their angles, form a square, which is the upper limit of the apophysis. Elaters and spores are developed in the capsule only so far down as this discoloured spongy surface extends. They do not grow out of it but are differentiated from the (apparently) homogeneous cells which in an earlier stage fill up the capsule, as in other hepaticæ; only, in the *Jubuleæ* the arrangement of the elaters and spores is on nearly vertical lines, whereas in most other *Jungermaniaceæ* it is on horizontal, or transverse lines. As the elaters are set symmetrically on the valves, from the apex down to at least midway of the capsule, and in the still unruptured capsule all trend downwards and converge on the apophysis—indeed are slightly adnate to it by their dilated truncate extremity—it is plain they must be of various lengths, those inserted nearest the apex, and therefore lying nearest the axis of the capsule, being much the longest. The contained spiral fibre in each elater increases in size and tension until it has gained sufficient force to overcome the adhesion of the valves to each other, when the capsule bursts open, the spores are partly ejected, and the elaters, set free below, but still attached to the valves by their upper and narrower end, spring upwards and project beyond the apex of the capsule in the form of little brushes, one on each valve.

The structure of the capsule and its contained organs is essentially the same in other *Jubuleæ* as in *Frullania*. In *Porella* (*Madotheca*), however, whose capsule has been considered to dehisce in a similar manner, the discoloured inner surface, sporiferous throughout, extends downwards to the apex of the pedicel, which is either not at all or only slightly dilated; but the 4 valves are rarely separated down to their base, sometimes indeed only halfway, and each valve is itself usually irregularly cloven (2-3-fid). This partial adhesion of the valves after maturity is seen occasionally in other genera. In *Scalia andina*, n. sp., the long, slender capsule is often truly follicular, bursting along one side only, and not quite to the apex; but the sutures of the 4 valves are plainly traceable, and are sometimes here and there slightly gaping.

The special characters of the subgenera and species of *Frullania*, as well as their aspect, habits, and geographical distribution, will be discussed in their place. Although the central and typical species of each subgenus, taken alone, might seem sufficiently distinct to justify our raising the latter to the rank of genera, the outlying species of one group

merge into those of the next so that no limit is assignable, and (in my judgment) it is best to preserve the genus *Frullania* entire, excluding only *Jubula*, which is truly *sui generis*.*

CLAVIS SUBGENERUM.

A. *Perianthium in sectione 4-gonum*, i.e., *postice bicarinatum, interdum, e carinulis interjectis, pluricarinatum.*

1. CHONANTHELIA.—Caulis vage pinnatim ramosus. Foliorum lobulus grandis, plerumque apice solum cucullatus (galeatus vel proboscisformis), inferne planus, longe lingulatus.

B. *Perianthium in sectione 3-gonum, carina postica unica (raro gemina).*

a. *Perianthium tuberculis villis squamulisve asperum.*

2. TRACHYCOLEA.—Caulis vage pinnatus. Lobulus alte galeatus, basi truncatus.

b. *Perianthium glabrum, sæpe nitidum.*

3. HOMOTROPANTHA.—Caulis pinnatim decompositus. Lobulus minutus, conchæformis vel saccatus, plerumque retroversus. Flores monoici, creberrimi, ramulis brevissimis seriatim secundis constantes. Perianthium suberostre.

4. METEORIOPSIS.—Caulis longissimus, pro more pendulus, pinnatus vel bipinnatus, apice indefinite crescens. Folia profunde cordata, cauli circumvoluta; lobulus erectus parvus tenui-cylindricus. Foliola angustiuscula, margine plano. Flores dioici, ♀ cladogeni. Perianthium longirostre.

5. THYOPSIELLA.—Caulis ad Thujæ instar concinne pinnatim ramosus, apice determinatus. Folia basi semicordata, lobulo cauli approximato, sæpius erecto, saccato, cylindraceo. Foliola ovali-rotunda, toto margine recurvo. Flores constanter dioici, in plurimis acrogeni. Perianthium rostellatum 3- (rarissime pluri-) carinatum, in paucis speciebus perfecte teres.

6. DIASTALOBA.—Plantæ pusillæ, caule pinnato vel bipinnato, ramulis sæpe microphyllis. Folia basi plerumque rotundata, vix semicordata, lobulo brevi saccato, a caule remoto, semper fere obliquo. Foliola subplana. Flores acrogeni, plerumque monoici. Perianthium rostellatum, interdum obcordatum, rarius pluricarinatum.

* See, for much valuable information on the structure of the capsule, measurement of spores, &c., of the *Jubuleæ*, J. B. Jack's Review of Dumortier's "Hepaticæ Europææ," in the *Botanische Zeitung* for 1877.

SUBGENUS I.—*CHONANTHELIA*, S.

Plantæ elatæ humilioresve, molles, sæpe flaccidæ, e viridi flavidæ fuscidulæve, raro rubescentes, rarissime totæ rufæ, vage vel inæqualiter pinnatim ramosæ, prostratæ, raro subcæspitosæ vel stratificatæ, humiliores interdum plagas circumscriptas vel pulvinulos efficientes.

Folia sat magna (·75–2·1^{mm} longa, latitudine vix minore) sæpe ovato-rotunda obtusissima, raro acuta subacuminatave rarissime apice subserrata, plus minus concava; lobulus magnus cauli sæpius parallelus et subcontiguus, in plurimis apice solo galeatus—galea in aliis speceibus compresso-subplana-concavave, in aliis pluribus juxta orificium compressa, vertice arcuato autem tubuloso-inflata, quasi-uncinata, margineque externo ad speciem in rostrum proboscemve prominula—inferne explanatus sublinguæformis basique interdum dentatus ; in paucis humilioribus totus galeatus, ore truncatus ; in omnibus fere quandoque evolutus. Cellulæ sæpius parvulæ (diam. $\frac{1}{30}$–$\frac{1}{55}$^{mm}) pachydermes.—Folia alteri caulis lateri adnata—illa sc. quibus foliola collateralia sunt—stylo parvo subulato, inter caulem et lobulum posito, sæpe aucta. Stylus hic, foliis caulinis interdum obsoletus, involucralibus (s. bracteis) tanquam lobulus tertius minor, semper fere adest.

Foliola sæpe maxima, foliis vix minora, orbiculata, v. latiora quam longa, in elatioribus profunde cordata, in pusillis subminora plerumque angustiora, in omnibus fere breviter emarginato-bifida, in speciebus duabus interdum integra, in unica ad ½ bifida.

Flores dioici vel monoici (autoici—raro paroici). Fl. ♀ terminales (in unica specie quasi-laterales) sæpe magni conspicui. Bracteæ (saltem intimæ) cum bracteola in excipulum obpyramidatum sæpius alte connatæ, apicibus liberis patulis decurvisve sæpe laciniatis, ciliatis, dentatisve, raro integerrimis, laciniis 1–3 utrinque inter bracteas et bracteolam interdum interjectis. Pistillidia bina.

Perianthia primum tetragona, *i.e.* postice bicarinata, immersa emersave; aliarum specierum (elatiorum præcipue), plicis carinisve inter angulos primarios intercalatis, subæqualiter 10–12-plicata ; pusillarum sæpius tetraquetra, vel 5–6- (rarissime 10-) carinata. Calyptra plerumque valida incrassata. Capsula globosa.

Amenta ♂ folium axillare raro superantia globosa oblongave ; bracteæ majusculæ 2–4-jugæ, rarissime ad 10–jugæ, arcte equitantes di- (raro tri-) andræ ; in florescentiis paroicis hypogynæ 2–3-jugæ.

Hab. Ad arborum ramulos, rarius in cortice, interdum ad saxa, vel etiam in ipsa terra inter fruticulorum radices ; paucæ planitiei incolæ, vix unquam ab hominum habitationibus remotæ ; pleræque monticolæ sunt, ad arbores domesticas, pomiferas præcipue, ad frutices in sepibus et in sylvis juxta semitas, necnon secus rivulorum ripas ubi pecora pascuntur, vigentes.

Distr. Omnes species inter tropicos, raro etiam in zona temperata australi, crescunt, nulla (quantum scio) zonæ temperatæ borealis incola. Ipse in America æquatoriali 21 species legi, earumque 6 (*Fr. gibbosa*, N., *Riojaneirensis*, Raddi, *tenera*, S., *leptomitra*, S., *arietina*, T., *Orinocensis*,

S.) solum in planitie, vel in Andium radicibus, nusquam supra 600^{m} alt.; cæteras omnes in Andibus sylvaticis, inter 1400 et 3500^{m} alt. E speciebus prius descriptis quatuor, sc. *Fr. hians, Arecæ, gibba*, et *arietina*, per Americam tropicam australioremque, a Mexico ad Brasiliæ et Chili confinia usque late diffusæ; aliæ nostræ, hic primum descriptæ, postea forsan in terris etiam distantibus detectæ fuerint. Ex Asia tropica et Africa australi species perpaucas cognovimus.

Obs. The most important character of this group is to have the perianth normally 4-angled on the section, there being two postical keels in addition to the two lateral ones; whereas in all the succeeding groups it is normally trigonous, with only a single postical keel. The transverse section is not square, but trapezoidal, the antical face being parallel to, but wider than, the postical, while the two lateral faces are oblique. All the faces are often depressed or concave, and in several of the larger species supplementary keels, or folds, obscure the primarily prismatic form, and render the perianth regularly 10- or 12-plicate. In a few other species the antical and postical faces (especially) are occasionally traversed by slight ridges for part of their length, so that the perianth becomes pluriplicate, but unequally, the four primary keels being always much more pronounced than the intercalated ones.

A more obvious feature resides in the large, and often polyphyllous, involucres, of which the innermost bracts (at the least) are connate for a good height up with the intervening bracteole into a wide-mouthed obpyramidal vase, while their free apices are often deeply slashed, or ciliate, or toothed.

We have no British species of this group, and only *Fr. dilatata* approaches the smaller species by the galeate subhemispherical lobule, but by its trigonous scabrous perianth it really belongs to the following group (*Trachycolea*). The Chonantheliæ are usually much larger than *Fr. dilatata*, from 1 to 4 inches long, sometimes as much as 6 or 8 inches, of a yellowish-green colour, rarely brownish, flaccid, vaguely branched, or, if pinnate, then with unequal branches, mostly short. They are usually prostrate, rarely stratified, but sometimes in pendulous tufts. The smaller species form circumscribed patches on the bark of trees, or cushions on the twigs. Leaves large, imbricated, usually roundish-ovate and very obtuse,—scarcely ever acute or toothed; the large broad lobule, at the fold subcontiguous and parallel to the stem, is usually explanate in its lower half, and in a few species more or less cut or crispato-sinuate, but the upper portion is mostly galeate-semiglobose, but compressed, and sometimes almost complanate towards the orifice, at the arch turgid and subcylindrical, so as to resemble a curved horn or beak (whence, I suppose, Taylor's name for one of the species, *Fr. arietina*). In a few of the smaller species the whole of the lobule is involved into a hemispherical reversed sac with a truncate mouth, without any explanate lower portion (or "appendiculus" as it is called in "Syn. Hep.") In nearly every species the lobule is occasionally unrolled into an ovate-lanceolate lamina, or is merely hooded at the apex.

The underleaves are often large—scarcely smaller than the leaves, broadly orbicular, and so deeply cordate at the base that the round auricles sometimes overlap each other; bidentate or very shortly bifid at the apex—in a single species cloven to the middle,—in two other species occasionally quite entire. They are flatter than in most other *Frullaniæ*,

and although sometimes beautifully crispate have not the strongly recurved or revolute margins of the *Thyopsiellæ*. The inflorescence is monoicous (autoicous, rarely paroicous) in a large proportion of the species, and dioicous in the rest.

I gathered in equatorial America 21 species of *Frullania Chonanthelia*. Only a few of them (about 6) are found in the plains and lower hills, and these I have never seen except near human habitations, or in cultivated ground, chiefly on fruit trees and palms, rarely on stones. At Pará, near the mouth of the Amazon; at San Carlos del Rio Negro, and at the cataracts of the Orinoco nearly midway across the continent; at Tarapoto, Chapaja, &c., in the eastern roots of the Andes; their custom is still the same—to grow on *Crescentia Cujete*, *Erythroxylon Coca*, *Guilielmia speciosa*, and other domesticated trees, but never in the woods. They are nowhere abundant and rarely ascend to 600 metres above the sea. Two of them, at least, *Fr. gibbosa* and *Fr. arietina*, are widely distributed in tropical America, from Mexico and the Antilles to South Brazil and Chili, but have everywhere the character of weeds.

The larger and handsomer species are all montane or subalpine, as are also a few of the smaller ones, and occupy a zone on the slopes of the Andes between 1200 and 3500 metres, but do not reach the upper limit of the wooded region. Even these seem to cling to the traces of man and the domesticated animals, and prefer to grow on trees that border open grassy places where cattle graze in the hill-forests, or in large natural pastures on scattered trees frequented by cattle for their shade; on bushes in hedgerows and at the fords of streams; and by waysides in woods—sometimes partly on the ground among low shrubs (*Vaccinia*, &c.), Madothecas and other tall hepaticæ, and mosses. One of the finest species is *Fr. hians*, L. et L., conspicuous for its large spreading deeply-cut involucres and 10–12-plicate perianth. The new species I have called *blepharozia*, *ringens*, *sphærocephala*, and *Campanensis* are also remarkable plants, all agreeing with *Fr. hians* in the 10–12-plicate perianths but differing from it in the dioicous inflorescence, and among themselves chiefly in the involucres. The large inflated bracts of *Fr. sphærocephala* are closely imbricated into a globose head, such as is not seen in any other *Frullania*. *Fr. blepharozia* is almost unique in the whole group in having the stem-leaves apiculate and sometimes serrulate at the point, while the bracts are beautifully ciliate. I found three of these species only on the western side of the cordillera (Chimborazo, Azuay, and the intervening valleys), but *Fr. hians* mainly on the eastern side. The latter is, however, widely distributed in tropical America—Mexico, West Indies, Caracas, New Granada, Ecuador, Bolivia, then passing eastward through the mountainous part of South Brazil to the very coast; but from the Amazonian plain it is quite absent; nor did I gather it in the Peruvian Andes, where, indeed, I barely ascended above the lower limit of its range (1400^{m}) near the equator. Specimens gathered by G. A. Lindberg in the province of Saõ Paulo quite agree with my own from the Andes. The species reappears in the Malay Archipelago (Java, &c.) as a variety with much crisped stipules, apparently quite the same as one I gathered on the upper Pastasa. *Fr. Arecæ*, Spreng. (=*Fr. Ecklonii*, G. L. et N. Syn. Hep. 413, nec Spreng.), grows in the same situations as *Fr. hians*, and like it has monoicous inflorescence, but the bracts are less conspicuous, and are only slightly toothed at the decurvo-cucullate apex. The true *Fr. Ecklonii*, Spreng. (=*Fr. Mundiana*, L. et G. Syn. Hep. 772) is its

South African congener, and differs only slightly from it. Very few species of Chonantheliæ are known to exist in Asia and Africa; in strong contrast with their abundance in tropical America.

One of the smaller mountain species, *Fr. semiconnata*, L. et L., may almost be considered a weed in the Quitenian Andes, for it prefers to grow in orchards, and especially on apple-trees, in lax tufts, along with *Orthotricha* and other mosses, in the uppermost cultivated region. A small form grows on old trees of *Buddleia*, &c., in groves frequented by cattle and sheep, up to 11,000 E. feet.

I. CLADOCARPICÆ.—*Rami* ♀ *brevissimi, bracteas solas* (*folia normalia nulla*) *gerentes.*

1. *Fr. brachyclada.*—Elata laxe subbipinnata dioica. F. laxe imbricata cordato-orbiculato-ovata rotundata; lobulus vix 2plo brevior oblongus apice galeatus, basi explanata lobum parum transiens. Foliola foliis ½ breviora cordato-orbiculata breviter bifidula, segmentis subacuminatis. Br. 4–5-jugæ acuminatæ subinciso-dentatæ; bracteola utrinque alte connata perangusta ad ½ bifida sublaciniata.

II. ACROCARPICÆ.—*Rami* ♀ *breves longioresve apice solo floriferi.*

A. *Folia lobulo elongato, dimidio supero galeato cucullatove, infero explanato. Foliola sæpius magna—interdum maxima—basi pro more cordata.*

a. *Perianthia* 10–12-*plicata, sæpe immersa.*

* *Flores dioici.*

2. *Fr. megalostipa.*—Elata flaccida pinnata, pinnis perbrevibus. F. conferta cordato-orbiculato-oblonga; lobulus magnus ligulatus apice galeatus, inferne in laminam basi rotundatam ultra lobum longe protractus; cellulæ mediocres. Foliola foliis paulo minora oblato-cordato-orbiculata emarginata, dentibus acuminulatis, auriculis baseos maximis late imbricantibus (Pl. ♂ sola).
3. *Fr. Campanensis.*—Elata dissite pinnata. F. imbricata semicordato-ovato-rotunda, margine plicam versus sinuato-crispa interdumque subincisa; lobulus plus duplo brevior angustus semioblongus infra galeam margine sinuato-incisus basi acuminatus lobum transiens. Foliola duplo breviora, prælata, cordato-reniformia *integra*, raro brevissime bidentula, auriculis baseos dissitis. Br. 3–4-jugæ alte connatæ apice decurvæ, intimæ foliis multo longiores, lobis omnibus acuminatis, anticis spinoso-ciliatis, posticis bracteolaque longilaciniatis. Perianthia anguste ovato-oblonga, prope basin excepta, tota longitudine 12-plicata.
4. *Fr. sphærocephala.*—Elata laxe pinnata. F. subdissita semicordato-oblongo-rotunda; lobulus angustus apice galeatus; c. parvæ. Foliola ½ minora orbiculata brevissime acute emarginata, basi profunde cordata, auriculis subcontiguis. Involucra maxima subglobosa; br. 3-jugæ arcte imbricatæ paleaceæ concavæ, intimæ alte connatæ, lobis acuminatis subdentatis, lobulis bracteolæque segmentis acuminatis incisis, lacinulis 1–3 inter bracteas et bracteolam utrinque sæpe interpositis. Per. obovato-pyriformia supra medium 10–12-plicata.
5. *Fr. ringens.*—Elata cuprea vel rufescens vage divisa, dein laxe pinnata. F. subcontigua late semicordato-ovato-orbiculata apice subcucullato obtusata, lobulus duplo brevior infra apicem galeatum in laminam rectangulari-oblongam basi 2–3-dentatam deorsum longe productus;

c. subparvæ. Foliola paulo minora cordato-ovato-orbiculata breviter emarginata, dentibus acutis, auriculis baseos magnis imbricatis. Br. 3–4-jugæ distantes decurvo-secundæ, intimæ alte connatæ, lobis subacuminatis argute spinoso-dentatis, lobulis bracteolæque segmentis tenuiacuminatis integerrimis, laciniis 3 tamen utrinque inter bracteas et bracteolam interpositis. Per. bracteis æquilonga subovato-oblonga tota longitudine 10–12-plicata.

6. *Fr. blepharozia.*—Humilior, grandifolia tamen, laxe bipinnata. Folia imbricata semicordato-ovato-oblonga apice decurvo sæpius acuta apiculatave; lobulus duplo brevior oblongus, basi 2–3-spinosus lobum paulo transiens. Foliola vix duplo breviora ovato-rotunda emarginato-bidentula, apicemque versus plerumque utrinque 2–3-denticulata, basi subcordata. Br. 5–7-jugæ, intimæ foliis plus duplo longiores cum bracteola alte connatæ, lobis omnibus acuminatis longiciliatis, laciniisque pluribus longis utrinque interjectis. Per. ovato-cylindrica, subfusiformia, 12-plicata.

** *Flores monoici.*

7. *Fr. hians.*—Elata mollis bipinnata, ramis sæpe elongatis. F. imbricata cordato-ovato-rotunda apice subcucullata; lobulus haud duplo brevior linguæformis apice uncinato-galeatus basi in laminam crispam basi 2–3-cuspidatam longe productus. Foliola ½ breviora cordato-orbiculata-reniformiave crispata brevissime emarginata, dentibus acuminatis, auriculis baseos subcontiguis. Br. plurijugæ maximæ fere stellato-patulæ, intimæ in excipulum alte connatæ, lobis planis acuminatis longilaciniatis, lobulis necnon bracteolæ segmentis in lacinias plures longas tenuiacuminatas margine revolutas ciliatasque fissis. Per. rectangulari-oblonga compressula 12-plicata.

8. *Fr. Arecæ.*—Elongata flaccida subbipinnata, pinnis brevibus. F. imbricata cordato-ovato-rotunda apice decurva; lobulus vix dimidio brevior apice galeatus subplano-compressus, inferne ligulatus basi triangulari-acuminata lobum paulo transiens. Foliola ½ breviora cordato-orbiculata, ad ⅓ emarginata, apicibus subacutis, auriculis baseos majusculis imbricatulis vel recurvis. Br. 4–5-jugæ decurvæ, intimæ foliis vix duplo longiores prælte connatæ, lobis cymbiformi-concavis cuspidatis apice pauciserratis, lobulis inæqualiter bifidis, segmentis (idem ac bracteolæ bifidæ) caudato-acuminatis, margine recurvo integerrimis, raro lacinula una alterave interjecta. Per. cylindracea subcompressa 10–12-plicata.

b. *Per.* 4(–5)-*angula, facicbus lævibus vel* (*antica præcipue*) *carinulatis. Flores omnium monoici.*

9. *Fr. viminicola.*—Robusta, humilis tamen, laxe bipinnata, ramis elongatis. F. subimbricata divergentia cordato-oblonga rotundata; lobulus subduplo brevior angustus apice galeatus (vix uncinatus) inferne subplanus ligulato-oblongus, basi rotundata lobum vix transiens. Foliola superiora magna, foliis subbreviora, cordato-orbiculata, breviter (ad ⅓–⅕ alt.) emarginata, dentibus acutis, auriculis baseos majusculis. Fl. ♀ in ipso caule ramisque terminales; br. 3–4-jugæ laxæ, intimæ ultra ½ alt. connatæ, lobis cucullato-concavis apiculatis denticulatis, lobulorum bifidorum bracteolæque segmentis linearilanceolatis, subulato-acuminatis recurvis, margine revoluto (laciniis

interjectis nullis). Per. subemersa obovato-oblonga tetraquetra, facie antica 1–3-carinulata. Var? *bicolor*. A typo differt fl. dioicis (?) foliis confertissimis apice lato recurvulis, lobulo apice distincte uncinato ; foliolis arcte imbricatis cordato-reniformibus.

10. *Fr. gibbosa.*—Humilis laxe pinnatim ramosa. F. imbricata squarroso-patentia late cordato-ovata rotundata, margine supero recurvulo, complicata, plica devexa sæpius diagonali ; lobulus magnus, interdum totus fere galeato-saccatus, pro more autem cucullatus vel omnino evolutus, basi nunquam ultra lobum protractus. Foliola foliis perpaulo minora cordato-reniformia sinuato-repanda vel paucidenticulata, emarginato-bidentata. Flores autoici, ♀ ramo brevi longioreve insidentes. Br. 3-jugæ, intimæ foliis paulo majores subæquilobæ, lobis rotundatis, lobulis obtusis interdum extus unilaciniatis ; bracteola utrinque alte connata bifida, segmentis semilanceolatis. Per. oblonga retuso-truncata rostellata 4-carinata, carinis rugulosis, lateralibus devexis.—Var. (?) *densissima*, robustior, magis regulariter subbipinnata, floresc. paroica, sc. ramulis floriferis brevissimis, basi ♂, apice ♀ ; bractearum lobulis subacutis ; per. apice subsensim in rostellum attenuatis.

11. *Fr. Riojaneirensis.*—Majuscula flaccida inequaliter bipinnata. F. conferta profunde cordato-orbiculata apice decurva ; lobulus haud duplo brevior apice alte uncinato-galeatus, inferne oblongus rotundatus cum lobo subconterminus. Foliola foliis paulo breviora cordato-reniformia brevissime emarginata, interdum integra, auriculis baseos majusculis. Fl. ♀ ramo sæpius brevi terminales ; br. plurijugæ patulæ, intimæ foliis ½ longiores, lobis abrupte apiculatis, lobulis integris biūdisve, bracteolæque utrinque alte connatæ bifidæ segmentis subacuminatis integerrimis vel sublacinatis. Per. anguste oblonga alte 4-carinata, antice sæpe 1–2-carinulata.

12. *Fr. tenera.*—Elongata pinnatim decomposita tenella. F. imbricata subplana semicordato-oblonga vel fere orbiculata ; lobulus magnus apice uncinato-cucullatus (vix unquam evolutus), appendiculo latiore basi rotundata lobum longe transeunte. Foliola dimidio folio majora late orbiculata ad vel ultra ⅓ bifida, segmentis patulis acutis, basi breviter cordata. Fl. autoici : ♀ bracteæ 3–4-jugæ, intimæ foliis subæquales in excipulum ore dilatatum alte connatæ, integerrimæ, lobis abrupte subacutis, lobulis subminoribus externe spina auctis bracteolæque segmentis acutis margine recurvis. Per. alte emersa anguste oblonga rotundato-truncata brevirostria alte 4-carinata, facie antica 2-carinulata. Calyptra basin versus 6 c. crassa.

13. *Fr. leptomitra.*—Pusilla elongata vage ramosa. F. subimbricata subsemicordato-oblonga, inferiora obtusata integerrima, superiora acuminulata apice serrata ; lobulus plerumque evolutus, raro apice uncinato-galeatus, basi lobum longe excedens. Foliola vix duplo breviora orbiculata, superiora cuneato-ovalia, apice ad ⅕–¼ alt. bidentata, dentibus acutis. *Fl. autoici.* Br. ♀ plurijugæ decurvo-secundæ, intimæ foliis vix duplo longiores breviuscule connatæ, lobis omnibus acuminatis spinoso-serratis, processu interbracteolari utrinque interposito ; br. exteriores (5–6-jugæ) lobis lobulisque acuminatis apice serratis. Per. emersa ovato-linearia alte obtuse plicato-5-gona. Calyptra tenuis, cellulam unicam, solum basin versus 2 cell., crassa.

14. *Fr. arietina.*—Pusilla subpinnatim ramosa. F. subimbricata oblongo-ovatove-rotunda, subsemicordata, apice rotundata ; lobulus haud duplo brevior apice insigniter uncinato-galeatus, infra galeam angustior subrhombeus, basi lobo subconterminus, haud raro totus evolutus. Foliola vix duplo breviora orbiculata ad $\frac{1}{3}$-$\frac{1}{4}$ emarginata, dentibus acutis, basi parum cordata. *Fl. paroici*, ♂ hypogyni. Br. ♀ 2–3-jugæ, intimæ foliis sat longiores alte connatæ, apice serratæ, lobis apiculatis, lobulis (interdum bifidis) bracteolæque segmentis acuminulatis. Per. subemersa oblonga tetraquetra, facie antica 2–3-carinulata (in vars., carinulis utrique faciei adjectis, interdum 8–10 carinata). Calyptra infra medium 4–6 cell. crassa.

15. *Fr. laxiflora.*—Humilis laxe pinnata, pinnis brevibus subramulosis. F. subcontigua late cordato-ovata obtusa ; lobulus duplo brevior apice alte galeatus, inferne oblongus canaliculatus lobo conterminus. Foliola haud duplo breviora ovato-orbiculata ad $\frac{1}{4}$ obtuse bifida, dentibus subacutis. Br. 2-jugæ dissitæ, profunde bilobæ, lobis acuminatis, supra basin posticam lacinia auctæ ; bracteola basi sola connata, angusta, bifida, laciniis subulato-acuminatis sæpissime integerrimis. Per. vix emersa late ovali-fusiformia alte tetraquetra.

B. *Foliorum lobulus brevior, totus galeatus (compresso-scmiglobosus) basi truncatus. Foliola mediocria, raro cordata. Per. tetraquetra, raro pluriplicata.*

a. *Foliola breviter emarginato-bifida.*

* *Flores monoici.*

16. *Fr. semiconnata.*—Humilis vage subbipinnata. F. imbricata semicordata rotundo-oblonga vel fere orbiculata insigniter concava ; lobulus plus duplo brevior late obovato-semiglobosus, ore truncato. Foliola $\frac{1}{2}$ breviora obovato-orbiculata brevi-emarginata, dentibus acutis. Br. 2–3-jugæ, intimæ foliis haud duplo longiores alte connatæ, lobis obtusis apiculatisve. lobulis bracteolæque segmentis acuminatis juxta basin sæpe sublacinulatis. Per. prælonga rectangulari-oblonga tetraquetra.

17. *Fr. subalpina.*—Pusilla vage subramosa. F. superne increscentia subimbricata caviuscula late ovata rotundata ; lobulus plus duplo brevior subsemiglobosus, ore truncato. Foliola duplo breviora obovato-cuneata emarginata. Br. 3-jugæ, intimæ foliis fere duplo longiores, (altera earum sola cum bracteola oblonga emarginata basi connata) integerrimæ fere æquilobæ, lobis anticis rotundatis posticis subacutis. Per. emersa pyriformia retusa 10-plicata.

** *Flores dioici.*

18. *Fr. stenostipa.*—Pusilla subramosa, *Fr. semiconnatæ* similis, differt florescentia ; foliis minoribus, lobulis sæpius cucullatis ore haud truncatis sed in laminam brevem deorsum protractis ; foliolis duplo angustioribus, ligulato-oblongis ; perianthiis pyriformibus 5-carinatis.

9. *Fr. flammea.*—Pusilla tenera inæqualiter pinnata. F. subimbricata late cordato-ovato-triangularia obtusa ; lobulus majusculus galeatus cucullatusve, obliquus, ore truncato. Foliola parva late ovali-cuneata breviter acute bifida. Br. 1–2-jugæ foliis submajores subinæquilobæ, lobis acutis obtusisve.

20. *Fr. decidua.*—Elongata subsimplex tenera ex parte denudata. F. subcontigua late cordato-ovata rotundata ; lobulus parvus galeatus suberectus, ore obliquo postice in dentem protracto. Foliola plus duplo breviora ovali-rotunda acute emarginata.

b. *Foliola ad ½ usque bifida.*

21. *Fr. Orinocensis.*—Pusilla, laxe subramosa. F. subimbricata semicordato-ovata rotundata ; lobulus 4plo brevior, sæpius evolutus, raro cucullatus. Foliola plus 3plo breviora cuneato-oblonga ad medium bifida, segmentis lanceolatis acutis. Br. 4-jugæ secundæ, intimæ foliis sublongiores, lobis obtusis, lobulis æquilongis acutis basi lacinula auctis ; bracteola ligulata vix ad ½ acute bifida. Per. subemersa oblongo-globosa postice bicarinata, carinis omnibus subrugulosis.

1. FRULLANIA BRACHYCLADA, Spruce.

Hab. M. *Tunguragua*, in arboribus, necnon in ipsa terra umbrosa.

F 1·7 × 1·55, *lobul* ·95 × ·45, *c* $\frac{1}{36}$; *f*^{la} 1·15 × 1·2, 1·0 × 1·1 ; *br.* 2·1 × 1·25 ; *br*^{la} 1·3 × ·3^{mm}.

Elata stratificata e pallide viridi rufescens ; caules 6-pollicares nigricantes laxe pinnati bipinnatique ; ramis sæpe ab brevi otis et ♀.

Folia laxe imbricata patula decurvula cordato-rotundo-ovata, obtusata v. sæpius rotundata repandula ; lobulus 2plo fere brevior, cauli subcontiguus subparallelusque v. basi subimbricans, oblongus apice galeato-saccatus, inferne in laminam longiorem, basi sinuato-repandam lobum perpaulo excedentem protractus margine recurvulus ; cellulæ parvulæ aquilateræ subpellucidæ.

Foliola dimidio breviora, cordato-orbiculata, subplana v. undulata, apice breviter bifidula, segmentis patulis subacuminatis.

Fl. dioici : ♀ *quasi-laterales*, ramulis brevissimis e caule ramisve oriundis constantes ; bracteæ 4–5-jugæ laxiuscule imbricatæ patulo-decurvulæ, intimæ foliis paulo longiores parce inciso-dentatæ lacinulatreve, ad medium complicato-bilobæ, lobo suboblique ovato-lanceolato acuminato, lobulo vix breviore multo angustiore, basi triangulari, apice caudato-acuminato, margine valide recurvo ; bracteola utrinque cum bracteis plus minus alte connata, brevior, perangusta, ligulata, ad medium bifida, margine recurvo sublaciniata.

Fr. megalostipa, S., huic sat similis, folia habet conferta, potius late oblonga quam ovata dicenda, lobulo multo longiore basi folium longe transeunte ; foliola magna multo latiora quam longa, *auriculis basalibus maximis* sese late imbricantibus ; itaque pro specie distincta certe habenda. Involucra etc. non licet comparare, quum *Fr. brachycladæ* flores ♀ solos, *Fr. megalostipæ* flores ♂ solos, tenemus.

2. FRULLANIA MEGALOSTIPA, Spruce.

Hab. Andes Quitenses, fl. *Pastasa* ripis, loco *Antombos*, in fruticum ramis cum *Fr. Brasiliensi.* Pl. ♂ sola aderat.

F 1·8 × 1·6, *lob* 1·3 × ·6 (apice) × ·85 (basi), *c* $\frac{1}{30}$; *f*^{la} 1·35 × 1·6, 1·25 × 1·4^{mm}.

Elata rufo-badia flaccida prostrata. Caules 3–6-pollicares flexuosi pinnati ; pinnæ perbreves (2–3^{mm} longæ) inferiores sæpe masculæ.

Folia arcte imbricata horizontalia, apice decurva, cordato-orbiculato-oblonga, basi brevissima laterali, fere transversâ, inserta, caulem antice late transeuntia ; lobulus dimidio brevior 2–3plo angustior, subligulatus, apice in galeam compressam rostratam, ore obliquo sinuato-crispulam, involutus, infra galeam sinuato-constrictus, deinde in laminam longiorem basin rotundatam versus sensim dilatatam, margine repando, ultra folii marginem longe protractus ; cellulæ mediocres subconformes æquilateræ subpellucidæ, pariete ad angulos incrassato.

Foliola foliis fere æquilata, breviora tamen, oblato-cordato-orbiculata, subplana, parum crispula, apice emarginata, sinu late triangulari, dentibus acuminulatis incurvis, auriculis baseos maximis cætero folio fere æquialtis, orbiculatis, late imbricantibus integerrimis, hilo radicellarum brevium medio tergo posito.

Flores dioici : ♀ haud visi. Amenta ♂ pinna folium caulinum sat excedente constantia, ovato-linearia subcompressa ; bracteæ 8–10-jugæ arcte equitantes obtuse complicato-carinatæ basi ventricosæ, lobis ultra medium connatis concavis, postico subminore acuto ; bracteolæ adsunt parvæ ovato-oblongæ emarginatæ.

A *Frullania Arecæ* florescentia dioica ; amentis ♂ polyphyllis ; foliorum lobulo basi rotundato ; foliolis sublatioribus basi profundissime cordatis, certe distat.

3. FRULLANIA CAMPANENSIS, Spruce.

Hab. Andes Peruvianos, in monte *Campana*, ad saxa, alt. 1400^{m}.

F. 1·5 × 1·25, *lob* ·6 × ·25, *c* $\frac{1}{40}$; f^{la} ·8 × 1·13 ; *br* 4·0 ; *per* 3·5 × 1·1^{mm}.

Elata, pallide olivaceo-viridis, flaccida prostrata. Caules 4-pollicares flexuosi intricati, basi parce divisi dein distanter pinnati, pinnis brevibus.

Folia subimbricata apice decurva oblique semicordato-ovato-rotunda repanda integerrima vel plicam versus sinuato-crispa obtuseque subincisa ; lobulus 2½plo brevior semioblongus, apice uncinato-galeatus, inferne subplanus sinuato-incisus basique plus minus acuminato-protractus, cauli parallelus sed non contiguus ; cellulæ parvulæ æquilateræ pachydermes, inferiores sensim submajores.

Foliola contigua cordato-reniformia, foliis fere duplo breviora sed parum angustiora, auriculis baseos mediocribus dissitis, margine recurvo subcrispulo repando, apice vel perfecte integra, rotundata retusulave, vel rarius brevissime bidentula, dentibus obtusis.

Flores dioici : ♀ terminales. Bracteæ 3–4-jugæ laxiusculæ, cum sua bracteola intermedia alte connatæ, apice libero valide decurvæ, intimæ foliis fere 3plo longiores, lobis oblique semicordato-ovatis acuminulatis spinoso-ciliatis ; lobulis imo longioribus (interdum bifidis) acuminatis, bracteolaque (bifida vel non) profunde laciniatis. Bracteolæ exteriores cordato-orbiculatæ dentato-spinosæ. Alteri bracteæ cujusque paris basi et altius adnatus est discus ovatus ovalisve, apice rotundato incisus, bractea 3plo brevior, textura tenuissima. Est quasi disculus f. caulinorum (quibus tamen raro adest) auctus.

Perianthia subimmersa anguste ovato-oblonga, basi tetragona, deinde ad apicem subtruncatum usque 12-plicata.

Fr. Riojaneirensis, Raddi, cum nostra convenit foliolis magnis interdum integris (multo rarius autem), differt florescentia monoica ; caule duplo breviore ; foliis suborbiculatis, lobulo integerrimo basique rotundato ; bracteis fere semper integerrimis ; et perianthiis tetraquetris (nec pluriplicatis).—*F. Arecæ*, Spreng., diversa est floribus monoicis ; foliolis majoribus semper distincte emarginatis, auriculis baseos magnis ; foliis lobulisque integerrimis ; bracteis apice cucullato solo paucidentatis ; &c.—*F. ringens*, S., habitu tenuiore, folii lobulo basi 1–3-dentato (cætero margine integerrimo) ; foliolis ovato-orbicularibus, longioribus quam latis, emarginatis ; bracteis minoribus longe dissitis, laciniis 3 utrinque juxta bracteolam interpositis.—*F. sphærocephala*, S., foliolis orbiculatis emarginatis profunde cordatis ; bracteis maximis in sphæram congestis, lobo solum dentato ; perianthio solum supra medium pluriplicato, longius distat.

4. FRULLANIA SPHÆROCEPHALA, Spruce. (TAB. I.)

Hab. Andes Quitenses, in sylvis montis *Azuay*, alt. 3000^{m}, e ramis pendula.

F 1·4×1·2, 1·3×1·0, *lob* ·8, *c* $\frac{1}{50}$; f^{la} 1·0×1·0, ·8×·8 ; *br* 4–5 ; *per* 3·5×2·0^{mm}.

Caules sub 6-pollicares laxe cæspitosi pendulique, pinnati, pinnis distantibus breviusculis raro pinnulatis.

Folia e viridi fuscidula subdissita, raro parum imbricata, patula apice decurva, oblongo-rotunda, basi semicordata ; lobulus vix duplo brevior, cauli subcontiguus parallelusque, angustus, lineari-oblongus galeatus erostratus, deorsum in laminam planam vel subtortam productus ; cellulæ parvæ subæquales, pariete incrassato.

Foliola distantia foliis subdimidio minora orbiculata fere plana, basi profunde cordata, auriculis vix imbricantibus, apice minutissime acute emarginata.

Flores dioici : ♀ pauci, in caule ramisque primariis terminales. Bracteæ sub 3-jugæ, foliis abrupte plus 3plo majores, flavidæ paleaceæ ventricoso-concavæ, apice conniventes, in involucrum globosum arcte imbricatæ ; intimæ alte connatæ, lobis acutis subdentatis, lobulis paulo minoribus bracteolæque segmentis plus minus acuminatis incisisque, lacinulis sæpe interpositis ; exteriores liberæ, plus minus incisæ, bracteolis magnis ovatis acuminatis profunde laciniatis, laciniis acuminatis sinubus gibbis.

Perianthia immersa obovato-pyriformia subrostellata, basi tetragona, supra medium 10–12-plicata, plicis obtusis corrugatis, ore demum plurifida.

Involucris maximis globosis paleaceis et perianthiis pyriformibus supra medium solum pluriplicatis, bene distincta species.

5. FRULLANIA RINGENS, Spruce.

Hab. in devexis montis *Chimborazo*, alt. 1200^{m}, ad arborum ramulos.

F 1·25×1·1, 1·1×1·0, *lob* ·6, *c* $\frac{1}{45}$; f^{la} 1·0×·9, ·9×·8 ; *br* 2·5 ; *per* 2·5×1·0^{mm}.

Elata pendula subcæspitosa rufo-badia vel cuprea. Caules 3–6-polli-

cares flexuosi intricati, inferne vage divisi, divisiones elongatæ pinnatæ, pinnis subdistantibus simplicibus vel subpinnulatis.

Folia inferiora vix contigua, superiora subimbricata, suboblique late ovato-orbiculata, apice decurvo-vel etiam involuto-cucullato obtusata, basi antica latissime semicordata, auricula semiorbiculata; lobulus duplo brevior, cauli contiguus parallelusque, apice galeatus subrostratus, deorsum in laminam rectangulari-oblongam basi 2–3-dentatam, vel spina unica magna quasi-caudatam, longe productus; cellulæ subparvæ fere conformes, pariete incrassato.

Foliola paulo minora, dissita, ovato-orbiculata breviter anguste emarginata, dentibus acutis, basi profunde cordata, auriculis imbricatis, margine ubique plano.

Flores dioici: ♀ in ramis longiusculis incurvis terminales. Bracteæ 3–4-jugæ longe dissitæ decurvo-secundæ, intimæ foliis duplo longiores, ad $\frac{1}{2}$ alt. connatæ bilobæ, lobis anticis subacuminatis parum cucullatis argute spinoso-dentatis, lobulis bracteolæque ad $\frac{1}{2}$ bifidæ segmentis angustis tenui-acuminatis repandisve, laciniis 3 acuminatis inter bracteolam et bracteas utrinque interpositis. Bracteolæ exteriores ovales bifidulæ parce spinoso-dentatæ.

Perianthia bracteis æquilonga subovato-oblonga rotundato-truncata brevirostellata, ab ipsa basi 10–12-plicata. Calyptra obovata basin versus 6 cellulas, medium versus 4 cellulas, crassa, demum ad medium usque in valvulas 3 subæquales rupta.

Obs. The leaf-lobule greatly resembles a slipper, covered only at the toe, or a lady's stirrup. The female flowers are often very numerous, and, being borne on the ends of longish upturned branches, they give to the plant a chandelier-like aspect. The hooked secund bracts look like the lobed lip of some ringent flower. The outer bracts are gradually smaller than the innermost, and less toothed, and at about the 4th or 5th pair from the perianth, the leaves are of the normal form, with saccate lobule and entire margins.

6. FRULLANIA BLEPHAROZIA, Spruce.

Hab. Pallatanga, Andium Quitensium, ad fruticum ramulos, alt. 1800^{m}.

F 1·6 × 1·2, 1·5 × 1·1, *lob* ·8 × ·5; *c* $\frac{1}{3\cdot5}$; f^{la} ·9 × ·8; *br* 4·0; br^{la} 3·0; *per* 2·8 × 1·1^{mm}.

Mediocris, e pallide viridi olivacea, laxe cæspitosa. Caules 2–3-pollicares flaccidi laxe subvage bipinnati.

Folia ad $\frac{1}{3}$ lat. imbricata horizontalia apice decurva, oblique *semicordato-ovato-oblonga abrupte subacuta*, subinde apiculata, raro obtusa, antice caulem transeuntia; lobulus duplo brevior, cauli approximatus parallelusque, oblongus, apice *anguste oblique cucullatus* (nec galeatus), basi parum angustatus 2–3-spinosus lobum deorsum paulo transiens margine subrecurvus; cellulæ mediocres incrassatæ, inferiores mediæ subelongatæ.

Foliola vix duplo breviora *ovato-rotunda* anguste obtuse emarginato-bidentula, dentibus acuminulatis incurvo-conniventibus, *apicem versus* plerumque *utrinque* 2–3-denticulata serrulatave, interdum integerrima, subundulata, basi *breviter cordato-decurrentia*.

Florcs dioici: ♂ ♀ terminales; bracteæ 5–7-jugæ, decurvæ, intimæ foliis plus duplo longiores ad medium in excipulum connatæ; lobis anticis oblique (v. semi-) ovali-lanceolatis acuminulatis apice in-

curvis cæterum *margine planis, inæqualiter longe laciniatis ciliatisve;* lobulis paulo brevioribus cum bracteolæ segmentis duobus latosubulatis acuminatis *subplanis* pauci-longilaciniatis, processibus pluribus subulato-acuminatis inter lobulos et bracteolam interjectis. Bracteæ exteriores paulo sensimque diversæ.

Perianthia immersa ovato-cylindracea subfusiformia subsensim in rostellum attenuata, 12-plicata.

F. hians pulchre diversa est florescentia monoica; foliis latioribus, apice rotundatis, basi postica crispatis, lobulo insigniter rostrato-galeato; foliolis *oblato-orbiculatis* margine sinuato-crispatis; involucri laciniis posticis margine valde *revolutis.*

F. Campanensis, habitu florescentiaque similis, caules habet magis elongatos paucirameos; folia rotundata, lobulo 2plo angustiore a caule dissitiusculo; foliola reniformia dimidio fere latiora quam longa sæpe subintegra; bracteas longe breviores, minus laciniatas, &c.

7. FRULLANIA HIANS, Lehm. et Lindenb.

Nov. et minus cogn. stirp. Pug. IV., 55; G. L. et N. Syn. Hep. 414.

Hab. Andes Quitenses, alt. 1500–2500^{m}: *Baños* in sepibus ad ramulos; *Tunguragua,* in ipsa terra ad semitas, sociis *Fr. Arecæ,* Lichenibus Vacciniisque, pulcherrime; *Chimborazo,* in arborum ramulis juxta tuguriola; etiam in valle fluvii *Pastasa* infra *Baños,* locis *Agoyán, Antombos,* &c. Specimina a cl. G. A. Lindberg in Brasilia australi lecta bene conveniunt. *Fr. galericulata* Tayl. Mst., a Rio Janeiro, forma minor videtur. Cæterum per Americam totam tropicam, locis montosis, humidis et umbrosis, haud raro videtur.

F 1·85 × 1·4, 1·5 × 1·3, *lob* 1·1 × ·4, ·75 × ·3, *c* $\frac{1}{10}$; *f^{la}* 1·15 × 1·35, 1·0 × 1·2, ·9 × 1·0, ·75 × 1·0; *involl* 4·0 *alt.*; *per* 3·5 × ·8^{mm}.

Elata mollis e flavido rufescens, stratificata, procumbens pendulave raro suberecta.

Folia imbricata patentissima, apice decurvo-cucullata, suboblique cordato-ovato-rotunda, antice caulem transeuntia, margine postico plus minus sinuato-crispa; lobulus haud duplo brevior cauli subcontiguus parallelusque, sublinguæformis, apice galeatus valide rostratus, infra galeam crispato-constrictus, deorsum in laminam lobum transeuntem undulato-crispam 2–3-cuspidatam (altera cuspide medio margine posita, altera basali—vel sæpe duabus dissitis, triangulari-acuminatis); cellulæ parvulæ æquilateræ subpellucidæ, pariete incrassato, marginales sub 3-seriatæ auricularesque cæteris paulo minores.

Foliola foliis $\frac{1}{2}$ breviora pallida imbricata cordato-orbiculata-reniformiave, margine repando sinuato-crispa, apice brevissime emarginata, sinu obtuso, dentibus acuminatis recurvis, auriculis baseos (=folii $\frac{1}{4}$) mediocribus rotundis contiguis vel imbricatulis.

Flores monoici: ♀ in caule et in ramis primariis (sæpe elongatis) terminales. Bracteæ pluri- (sub 7-) jugæ, maximæ, subconflatæ, late fere stellatim patulæ; intimæ ad medium usque in excipulum connatæ, lobis planis semicordato-ovatis sensim acuminatis longilaciniatis; lobulis et bracteolæ segmentis plurifidis, laciniis sub 12 inæquilongis squarrose recurvis longe tenui-acuminatis revoluto-canaliculatis margine plus minus incisis ciliatisve. Bracteæ secundariæ tertiariæque in excipulum minus altum connatæ; lobis autem a primariis vix

diversis laciniato-serratis; lobulis bracteolaque magna ovali apice ad $\frac{1}{3}$ bifida toto margine crispatis et longilaciniatis-ciliatisve. Bracteæ exteriores in foliorum formam sensim transeuntes. Bracteola sexta suborbiculata margine crispata et plus minus dentato-spinulosa apice biapiculata; septima subintegerrima foliolis conformis.

Perianthia subimmersa compresso-cylindrica (rectangulari-oblonga) rostellata 12-plicata.

Amenta ♂ pro more ramigena, folio axillari longiora, ovato-linearia; bracteæ 8–10-jugæ parvulæ arcte imbricatæ, diandræ.

Var. CRISPA, S., foliis, lobulis, foliolisque margine pulchre sinuato-crispis, basi bispinosis.

Obs. The long, almost teretely revolute laciniæ of the bract-lobules, beset here and there with widely-spreading teeth, resemble elk's-horns; while the large, flat, sharp-pointed, and sharply-toothed (or spinose) antical lobes are widely different from the cucullate slightly-toothed bract-lobes of *Fr. Arecæ*.

8. FRULLANIA ARECÆ (Spreng).

Jung. Arecæ, Spreng., N. Entdeck. II., 99; "*Frull. Ecklonii*, Spreng.," G. L. et N. Syn. Hep., 413 (nec Spreng. Syst. Veg. IV., 2, 324).

Hab. In Andibus Quitensibus, alt. 1500–3000^{m}, haud infrequens; *Baños*, ad pedem *M. Tunguragua*, in fruticum ramulis, cum *Fr. hiante* mixta; *M. Guayrapata*, inter *Lejeuneas* serpens, &c. Per americam tropicam et australem ad Chili usque dispersa.

F 2·0×2·0, 1·8×1·55, *lob* 1·3×·5, *c* $\frac{1}{35}$–$\frac{1}{30}$; f^{la} 1·4×1·5, 1·2×1·3; *br* 3·1–3·5; *per* 3·2×1·2, 3·0×1·1^{mm}.

Elata prostrato-stratificata, e viridi rufo-badia. Caules 2–5-pollicares flexuosi flaccidi pinnati et subbipinnati, pinnis brevibus inæquilongis, pinnulis sæpe ad amenta ♂ redactis.

Folia imbricata patentissima vel subdivaricata, cordato-ovato-rotunda, apice subcucullata, basi antica caulem late transeuntia; lobulus vix dimidio brevior cauli subcontiguus ligulatus, deorsum paulo ampliatus, subplanus repandus, basi triangulari acutus vel subacuminatus, raro obtusus, lobi marginem paulo transiens, apice galeato-saccatus compresso-planus vel supra concavus (neque vertice inflato-uncinatus); cellulæ mediocres subæquilateræ, pariete incrassato.

Foliola imbricata foliis dimidio breviora, *viridia*, subplana cordato-orbiculata, paulo oblata, ad $\frac{1}{3}$ alt. emarginata, sinu triangulari, apicibus acutis vel vix subacuminatis, auriculis baseos majusculis (=folioli $\frac{1}{4}$) subrotundis, vel recurvis vel subplanis, contiguis vel imbricatulis.

Flores monoici: ♀ in ramo (haud abbreviato) assurgente terminales. Bracteæ 4–5-jugæ laxiusculæ decurvæ, intimæ foliis vix duplo longiores in infundibulum prælte connatæ (antice tamen liberæ et convolutive imbricatæ); lobis anticis late ovalibus cuspidatis apiculatisve cymbiformi-concavis apice 3-pauci-serratis-denticulatisve; lobulis inæqualiter bifidis, segmentis (idem ac bracteolæ angustæ bifidæ) caudato-acuminatis, plus minus recurvo-canaliculatis, rarius lacinula una alterave interjecta auctis. Bracteæ exteriores sensim minores apiculatæ subintegerrimæ, cum bracteola ovali-lanceolata apice anguste bifida minus alte connatæ.

Perianthia ex involucri ore recurvo-hiante vix vel paulo emersa cylin-

dracea subcompressa obtuse 10–12-plicata, apice constricto obsolete rostellata. Capsula globosa.

Amenta ♂ ad caulem et ramos primarios, folium axillare vix æquantia, ovato-globosa subcompressa; bracteæ 3–4-jugæ complicato-concavæ bilobæ, lobis fere semicircularibus apice rotundatis.

Ad *Pallatanga*, in Andibus Quitensibus occidentalibus, adest forma minor, foliolis exacte fere orbiculatis, et bracteis cucullatis argute spinuloso-dentatis.

9. FRULLANIA VIMINICOLA, Spruce.

Hab. Andes Quitenses, alt. circiter 3000^{m}, ex arborum ramis pendula, a cl. JAMESON lecta.

F 1·8 × 1·25, 1·3 × 1·0, *lob* ·8 × ·35, *c* $\frac{1}{40}$–$\frac{1}{35}$; *f*^{la} 1·3 × 1·4, ·8 × ·75; *br* 3·0; *br*^{la} 2·3 × 1·5; *per* 3·0 × 1·3, 2·6 × 1·1^{mm}.

Robusta pusillave e viridi olivacea. Caules 1–4-pollicares laxe vage bipinnati, ramis paucis elongatis divaricatis.

Folia subimbricata divergentia decurvo-cucullata valde oblique cordato-oblonga, apice rotundato repanda, basi antica caulem late transeuntia; lobulus subduplo brevior angustus ligulato-oblongus, apice alte galeatus et vel compresso-planus v. subinflato-uncinatus, dimidio infero subplanus rotundatus lobi margine subconterminus; cellulæ parvulæ subconformes.

Foliola inferiora mediocria, superiora magna, foliis subbreviora, superficie autem vix minora, cordato-orbiculata breviter (ad $\frac{1}{7}$–$\frac{1}{6}$ alt.) emarginata, sinu triangulari, dentibus subacutis apiculatisve, auriculis baseos majusculis minusculisve reflexis v. conniventibus.

Flores monoici: ♀ in caule et ramis primariis terminales. Bracteæ 3–4-jugæ laxæ, intimæ foliis sat longiores, a basi ultra medium in excipulum campanulatum connatæ; lobi late ovati abrupte acuminulati cucullato-concavi spinuloso-denticulati, raro integerrimi; lobuli bracteolæque bifidæ segmenta acuminata subintegerrima squarroso-recurva, margine plus minus revoluto. Bracteæ exteriores minus alte connatæ inque foliorum formam sensim vergentes.

Perianthia subemersa obovato-oblonga, ex apice retusulo rostellata, compressula, tetraquetra, facie antica late 1-carinata v. humiliter 2–3-carinulata.

Amenta ♂ (perrara) folio axillari subæquilonga, oblongo-rotunda compressa; bracteæ 3–4-jugæ turgidæ subæquilobæ. (Plantæ mere fœmineæ frequentiores sunt.)

Ab hac differt *Fr. Arecæ*, Spreng., caule longiore magis eleganter pinnato, ramis brevibus; foliis majoribus latioribus subovatis; foliolis basi grandi-auriculatis; præcipue autem perianthiis æqualiter 12-plicatis.

Var. *bicolor* (=*Fr. excipulifera*, S. Mst.). Humilis vage ramosa. A *Fr. Jamesoni* differt (an specifice?) foliis valde confertis, dimidio supero rubescentibus, infero albidis, rotundioribus, minus concavis, margine apicis lati recurvulo, lobulo latiore apice distincte uncinato-galeato, basi lobum paulo transeunte; foliolis arcte imbricatis, cordato-reniformibus; perianthiis vix emersis anguste ovato-oblongis; demum floribus dioicis? Cum *Fr. gibbosa* foliis bicoloribus, margine recurvulo (nec tamen squarrosis) paulo convenit, cæteris caracteribus præcipueque bracteis cuspidatis denticulatis satis differt.—*Hab.* In

Monte *Campana* Andium Peruvianorum, ad ramos, alt. 1200^{m}, ipse legi.

10. FRULLANIA GIBBOSA, Nees.

G. L. et N. Syn. Hep. 411.

Hab. in planitie Amazonica rarius, arboricola et saxicola, semper juxta habitationes. Per Americam tropicam dispersa.

F 1·0 × 1·0 ; *lob* ·65 × ·45, *c* $\frac{1}{10}$; *f*^{la} ·8 × 1·1 ; *br* 1·3 ; *per* 1·75 × ·75^{mm}.

Humilis e viridi rufescens plagas latas vix stratificatas sistens. Caules prostrati arcte repentes implexique 1–2-pollicares laxe pinnatim ramosi.

Folia plus minus arcte imbricata squarroso-patentia, dimidio supero rufobadia, infero pallida, convexula, margine supero tamen recurvulo, late cordato-ovata rotundata ; lobulus paulo brevior, ad basin cauli contiguus, plica recta vix unquam cauli parallela sed angulo sub 45° (in lobulis evolutis majore) devexa, alte galeatus (compresso-paraboloideus) ore fere truncato, vel plus minus late cucullatus, vel persæpe evolutus oblique ovato-triangularis obtusus, basi interna nunquam ultra lobi marginem protractus ; disculus (s. lobulus adventitius) parvus obovatus, ipsissima basi lobulo connatus, a foliolo collaterali semper liber ; cellulæ parvulæ globoso-hexagonæ subæquimagnæ chlorophyllosæ, pariete incrassato.

Foliola imbricata, foliis fere æquimagna, oblata, cordato-reniformia sinuato-repanda, raro grosse pauci-denticulata, emarginato-bidentata, sinu lunulari vel subacuto, dentibus subacutis raro apiculatis, margine recurvulo.

Flores monoici (autoici) : ♀ in ramo brevi longioreve terminales. Bracteæ 3-jugæ, raro plures, intimæ foliis paulo majores suberectæ complicatæ subæquilobæ, lobo antico rotundato, postico obtuso margine recurvo interdum extus lacinia aucto ; bracteola angusta utrinque alte connata bifida, segmentis semilanceolatis integerrimis vel grosse laciniatis.

Perianthia semiemersa, oblonga vel obovato-oblonga retuso-truncata rostellata, 4-carinata, carinis rugulosis, lateralibus devexis, facie antica latiore unisulca ; textura, e cellulis nucleo stellari (sæpe intense rubro), pariete ecolorato diaphano ad angulos incrassato, pulchre tesselata.

Amenta ♂ axillaria, folio caulino subæquilonga, ovato-globosa ; bracteæ 5–6-jugæ majusculæ arcte equitantes æquilobæ diandræ, raro triandræ.

Var. (?) *densissima* (*Fr. densissima*, S. Mst.). Robustior sæpe bipinnata, pinnis inferioribus superioribusque brevissimis simplicibus, mediis longioribus pinnulatis, pinnulis sæpe floriferis. Folia arctissime imbricata squarrosa, margine recurvo, latiora quam longa, disculo majusculo orbiculato vel reniformi folioli auriculæ alteræ tergo (raro margine) adnato. Foliola arcte imbricata prælata, margine repando recurvo, basi profunde cordata, auriculis lunato-oblongis conniventibus. Ramuli floriferi brevissimi, basi ♂ apice ♀. Bracteæ ♀ 3-jugæ iis formæ prioris similes, lobulis autem subacutis. Bracteæ ♂ 2–3-jugæ femineis sensim minores subæquilobæ diandræ, bracteolis lineari-ovalibus bidentalis, hinc basi bracteæ connatis. Perianthia apice in rostellum subsensim attenuata.—*Hab.* In cortice

et saxis in Andium radicibus ad *Tarapoto*, etiam ad *S. Carlos* fluvii *Negro*. Forsan e florescentia paroica a *Fr. gibbosa* diversa, amenta mere mascula autem interdum (sed rarissime) idem ac in priore inveniuntur. In utraque forma folia alterna sola disculifera, iisdemque foliola collateralia sunt.

11. FRULLANIA RIOJANEIRENSIS, Raddi ?

Frullanoides Riojaneirensis, Raddi, in Mem. di Mod. 1823, p. 37, et 1827, t. 2, f. 4. *Frullania Sebastianopolitana*, Lindenb., in Syn. Hep. p. 412.

Hab. Tarapoto, in Andibus Peruvianis, ad cortices, cum *F. gibbosa* Nees mixta. Variis locis Brasiliæ, Peruviæ, insulæ Trinidad, &c., fide Syn. Hep. auctorum l. c.

F 1·25 × 1·3, 1·25 × 1·15, *lob* ·75 × ·45, *c* $\frac{1}{10}$; *f^la* 1·0 × 1·15, ·9 × 1·1; *br* 1·75; *per* 2·4 × 1·0, 2·0 × 1·0^mm.

Grandiuscula prostrata vix stratificata, flavescens flaccida. Caules 2–3-pollicares bipinnati, ramis inæquilongis pro more brevibus.

Folia tenera arcte (ultra $\frac{1}{2}$ lat.) imbricata horizontalia, apice valide decurva, cordato-orbiculata; lobulus haud duplo brevior cauli parallelus et paulo dissitus, dimidio supero alte uncinato-galeatus, infero æquilatus planus basi rotundata lobi marginem vix superans, vix unquam (nisi ad ramos fæmineos) evolutus; cellulæ parvulæ æquilateræ, pariete incrassato, inferiores paulo majores pellucidioresque.

Foliola conferta arcte imbricata, foliis paulo minora, cordato-orbiculata-reniformiave brevissime (ad $\frac{1}{12}$ alt. solum) marginata, sinu lato dentibusque subacutis, rarissime integra, caviuscula, auriculis baseos majusculis subrotundis reflexis raro conniventibus.

Flores monoici: ♀ in ramo brevi, raro subelongato, terminales. Bracteæ pluri- (5–9-) jugæ ramum totum tenentes; intimæ foliis dimidio longiores, in excipulum 4-gono-obpyramidatum, antice lobis prælate imbricatis (nec connatis) clausum, alte coalitæ; lobis obovatis ex rotundo subapiculatis; lobulis (sæpe bifidis) bracteolæque segmentis triangularibus subacuminatis, margine apiceque late recurvis, integerrimis raro sublaciniatis. Bracteæ exteriores sensim minores, minus alte connatæ, lobulo autem semper evoluto.

Perianthia emersa anguste oblonga sat compressa alte 4-carinata ex rotundato apice rostellata, facie antica lata convexa apicem versus sæpe 1–2-carinulata. Calyptra duplo minor late pyriformis infra medium 6 cell. crassa, superne sensim attenuata.

Amenta ♂ axillaria folium paulo excedentia ovato-conica; bracteæ 8–10-jugæ arcte equitantes subæquilobæ 2-andræ; antheridia globosa in stipite æquilongo cellulis uniseriatis conflato.

12. FRULLANIA TENERA, Spruce.

Hab. In Andium radicibus Peruvianorum, præcipue secus fl. *Huallaga* ripas, locis *Yurimaguas*, *Chapaja*, *Tarapoto*, &c.; etiam ad fluvii *Negro* ostia (flum. Amazonum confluentis) et ad cataractam *Maypures* flum. *Orinoco*; semper corticola, arbores domesticas diligens.

F (*sine lobulo*) 1·5 × 1·4, ·85 × ·65, *lobulus* 1·0 × ·6, ·6 × ·35, *c* $\frac{1}{50}$; *f^la* ·9 × ·9, ·55 × ·5; *br excipulum* 1·4 *alt.*, 1·8 *ore latum*; *per* 2·0–2·5 × ·8^mm.

Tenella sæpe pallida pellucidaque vel flavida, rarius e viridi olivacea rufulave, strato tenui effusa. Caules 1–3-pollicares pinnatim decompositi, ramis pro m. breviusculis.

Folia plus minus imbricata—raro ad ½ lat usque—subplana apice decurvula, late oblique semicordato-oblonga rotundata, caulina fere orbiculata; lobulus = lobi ⅔, apice uncinato-cucullatus vel anguste galeatus (probosciformis) deorsum in laminam latiorem acinaciformi-oblongam, margine interno (i.e. plica) cauli parallelo concavo vel fere recto, externo rotundato, sinuato-repandam, basi ampliata rotundata lobi marginem sat longe transeuntem protractus, vix unquam (nisi ad ramos floriferos) evolutus; cellulæ parvæ, inferiores submajores, subæquilateræ subpellucidæ.

Foliola subcontigua dimidium folium excedentia planiuscula late orbiculata ad vel ultra ⅔ bifida, sinu lato subobtuso, segmentis patulis subacutis raro subapiculatis, sæpe inæquilongis, sinuato-repanda, basi breviter cordata.

Flores monoici: ♀ in ramo brevi, raro longiore, terminales. Bracteæ 3-(4-) jugæ, intimæ foliis caulinis subæquales, in excipulum late obpyramidatum, ore patulum, alte (ad ¾) connatæ, lobis late ovato-triangularibus perabrupte subacutis, lobulis subminoribus acutis, externe spina auctis, subrecurvo-canaliculatis; bracteola oblonga apice breviter bifida, segmentis acutis margine recurvis. Bracteæ exteriores subminores, minus alte connatæ, forma simili; bracteolæ anguste oblongæ, apice erecte bidentulæ.

Perianthia alte emersa anguste oblonga, ovatove-oblonga, rotundato-truncata brevirostria alte 4-carinata, facie antica 2-(raro 3–4-) carinulata. Calyptra perianthio plus duplo brevior globoso-pyriformis, basi tubulari 6 cell., infra medium 3–4 cell. crassa, superne sensim attenuata, demum ab apice profunde bivalvis.

Amenta ♂ ad caulem et ramos axillaria, sæpe a fl. ♀ haud remota, folio subbreviora oblongo-globosa; bracteæ 3–5-jugæ mediocres subæquilobæ.

Ad *Tarapoto* advenit forma condensata, foliis confertis subminoribus. Ad Chapaja altera forma flavida laxifolia, sæpe fere plumæformi-pinnata, foliis iis *Fr. Riojaneirensis* vix minoribus, bene distincta autem lobulo inferne valde dilatato apice angustius cucullato-uncinato; præcipueque foliolis minoribus multo magis distincte bifidis. Planta Maypurensis est sordide viridis, bracteasque fl. ♀ habet sæpe plurijugas, vel saltem folia omnia ad ramos fœmineos lobulis evolutis instructa.

Ab hac specie certe distat *Fr. arietina*, Tayl., florescentia paroica (i.e. floribus ♂ hypogynis); foliis subminoribus angustioribusque, lobulo minore, appendiculo angustiore quam galea (latiore in *Fr. tenera*); foliolis breviter (ad ⅕–¼ alt. solum—nec ultra ⅓) bifidis; bracteis fere constanter serratis.—*Fr. Riojaneirensis*, Raddi, perfecte diversa est statura submajore, præsertim foliolis magnis breviter emarginatis imove omnino integris. Descriptio tamen hujusce speciei in "Synopsi Hepat." probabiliter ex-p. ad *Fr. teneram* spectat, saltem quoad "amphigastria foliis duplo minora," qualia in *Fr. Riojaneirensi* vera nunquam vidi. Specimina a cl. G. A. Lindberg in Brasilia australiore lecta, a Gottscheo ipso ad *Fr. Riojaneirensem* relata, cum meis sub eodem nomine supradescriptis ad amussim congruunt.

13. Frullania leptomitra, Spruce.

Hab. Ad pedem Andium Quitensium, secus fl. *Bombonasa*, in arboribus super *Fr. replicatam* parasitans.

F ·9 × ·65, *lob evol* ·6 × ·35, *c* $\frac{1}{4\,5}$; *f*^{la} ·5 × ·5, ·55 × ·45; *br* 1·6; *per* 3·0 × 1·0, 2·1 × 1·0^{mm}.

Pusilla viridis, dein fuscidula, flaccida. Caules 2-pollicares prostrati vage ramosi, ramis ♀ assurgentibus.

Folia subimbricata late patula subplana oblonga vel ovato-oblonga, basi antica subcordata caulem parum transeuntia, inferiora rotundata obtusatave repanda integerrima, superiora sæpe apiculata acuminulatave apiceque serrata; lobulus sat magnus erectus sæpissime evolutus ovatus acutus, raro apice alte uncinato-galeatus-cucullatusve, dimidio infero æquilatus (vel parum latior) late acinaciformis subplanus lobum late transiens; cellulæ subparvæ, annulo opaco intus cinctæ, pariete subincrassato.

Foliola vix duplo breviora orbiculata, superiora cuneato-ovalia, subplana, apice ad $\frac{1}{3}$–$\frac{1}{4}$ obtuse bidentata, dentibus acutis sæpe conniventibus.

Flores monoici: ♀ in caule ramisque terminales. Bracteæ plurijugæ laxæ decurvo-subsecundæ, intimæ foliis fere duplo longiores patulæ, lobis anticis ovatis acuminatis serratis vel subspinosis, lobulis paulo angustioribus revoluto-canaliculatis, inæqualiter bifidis vel saltem spina externa auctis, segmentisque bracteolæ bifidæ utrinque breviuscule connatæ paucispinosis.—Bracteæ exteriores 5–6-jugæ) sensim subminores, lobis lobulisque acuminatis serratis; bracteolis subliberis cuneato-ligulatis, apice bifidulis serratisque. In aliis stirpibus videmus folia plurima infrafloralia subapiculata apiceque subserrata, lobulo evoluto acuminato instructa, in bracteas sensim vergentia.

Perianthia emersa ovato-linearia—interdum prælonga,fere ovato-subulata,—ex apice rotundato retusove brevirostria, subcompressa, alte obtuse plicato-pentagona, subinde, carinula una alterave utrique faciei adjecta, 7–10-carinata. Calyptra duplo brevior, pyriformis, tenuis, basin versus 2 cell. superne 1 cell. solum, crassa, demum bifide rupta.

Amenta ♂ cauligena, folio axillari sæpius breviora, compresso-globosa-oblongave, bracteis 3–5-jugis.

Planta pulchella, forsan pro var. *Fr. teneræ* insigni habenda, differt autem foliis longioribus plerisque apice acuminulato serratis, lobulo sæpissime evoluto (in *Fr. tenera* fere constanter apice galeato); foliolis brevius bidentatis, superioribus subcuneatis; bracteis minus alte connatis subspinoso-serratis; præcipueque calyptra basin versus solum 2 (nec 6) cellulas crassa.

14. Frullania arietina, Tayl. Mst.

G. L. et N. Syn. Hep. 413.

Hab. Per sylvam Amazonicam et Andes inferiores (vix supra 500^{m} ascendens) haud infrequens, ad arbores cultas nusquam ab habitationibus remotas: *San Carlos* del *Rio Negro*, ad *Crescentiam Cujete*; *Tarapoto*, ad *Erythroxylon Coca*; &c.

F 1·0 × ·8, ·9 × ·8, ·8 × ·62, *lob* ·6 × ·3, ·5 × ·25, *c* $\frac{1}{50}$—$\frac{1}{45}$; *f*^{la} ·6 × ·75, ·5 × ·5, ·4 × ·5 ; *br* 1·75—1·5 ; *per* 2·5 × 1·0, 2·0 × ·8^{mm}.

Pusilla, magnitudine *Fr. dilatatæ*, virescens olivaceave, prostrata. Caules pollicares vel longiores, vage vel subpinnatim ramosi, implexi.

Folia subimbricata, oblongo-vel ovato-rotunda, planiuscula, apice decurvulo rotundata, basi subsemicordata ; lobulus majusculus cauli subparallelus et parum dissitus, dimidio supero alte galeatus (e vertice arcuato tubuloso-inflato decurvo proboscem, vel arietis cornu, simulans), infero angustior in laminam subrhombeam lobi margine subconterminam protractus haud raro perfecte evolutus subplanus ovato-triangularis obtusus acutusve ; cellulæ parvæ pellucidæ, pariete incrassato, basales perpaulo majores.

Foliola subdissita foliis vix duplo breviora orbiculata, breviter (ad $\frac{1}{5}$–$\frac{1}{4}$) emarginato-bifida, sinu subobtuso, dentibus acutis, margine plano, basi amplexante parum cordata.

Flores monoici (paroici) : ♀ in ramo brevi longioreve terminales. Bracteæ 2–3-jugæ, intimæ foliis sat longiores in excipulum obpyramidatum ore recurvo-patulum coalitæ, subinæquilobæ, lobis anticis ovatis apiculatis serratis, raro integerrimis, lobulis (interdum bifidis) necnon segmentis bracteolæ breviter bifidæ acuminulatis parce dentatis incisisve, vel fere integerrimis. Bracteæ exteriores sensim breviores breviusque connatæ.

Perianthia subemersa oblonga compressula 4-quetra, facie antica latiore obtuse 2–3-carinulata, raro faciebus lateralibus etiam posticaque carinulatis, rostello brevi ore subampliato. Calyptra pyriformis, basi 6 cell., medium versus 4 cell., apice 1 cell. crassa.

Andrœcia hypogyna—raro in ramuli ♀ longioris basi ipsa posita ; bracteæ ♂ 2–3-jugæ foliis consecutivæ, paulo breviores, æquilobæ, diandræ. Rami mere masculi rarissime adveniunt.

Var. *pluricarinata*.—Laxifolia ; fol. lobulis plerisque evolutis ; foliolis interdum paulo magis profunde fissis; bracteis spinulosis; perianthiis 7–10-carinatis-plicatisve.—*Hab.* ad *San Carlos* fl. *Negro.*

Obs. In omnibus formis perianthii sectio trapezoideo-quadrangula semper invenitur, carinulis intercalatis multo minus elevatis quam quatuor carinæ primariæ.

Taylor would probably have included under his "*arietina*," not only the species above-described, but also *Fr. tenera* and *gibbosa*. I have specimens, gathered in Demerara by Dr Campbell, and named "*Fr. arietina*" by Taylor himself, which are truly the normal form of *Fr. gibbosa*.

15. FRULLANIA LAXIFLORA, Spruce.

Hab. Andes Quitenses, in cordillera occidentali ad arbores pomiferas, loco *Guataxi*, alt. 2200^{m} ; in cordillera orientali juxta cataractam *Agoyan* supra saxa, alt. 1600^{m} ; ex Andibus Novo-Granatensibus, a cl. ROB. CROSS lectam, varietatem pulchram habeo.

F 1·1 × 9, *lob* ·5–·6, *c* $\frac{1}{50}$—$\frac{1}{40}$; *f*^{la} ·7 × ·6 ; *br* 1·5 ; *per* 1·5 × 1·0^{mm}.

Humilis, strato tenui repens, atro-sanguinea, rufo-badia vel virescens, tenera. Caules 1½–3-pollicares pinnati, ramis laxis brevibus interdum pinnulatis.

Folia dissita vel subimbricata convexa late cordato-ovata, basi antica

caulem longe excedentia, apice subangustato obtusa rarius rotundata; lobulus duplo brevior cauli contiguus et subparallelus, dimidio supero alte galeatus, infero lamina oblonga canaliculata lobum haud superante constans; cellulæ subparvæ æquilateræ, pariete incrassato, inferiores paulo majores.

Foliola dissita foliis haud duplo breviora ovato-orbiculata ad $\frac{1}{4}$ emarginato-bifida, sinu obtuso, dentibus subacutis, basi e margine recurvo angustata, raro subcordata.

Flores monoici: ♀ in ramo brevi, raro longiore terminales. Bracteæ bijugæ, laxæ, longius inter se dissitæ quam folia caulina, recte patulæ vel decurvæ, profunde bilobæ, lobo ovato sensim acuminato repandulo, lobulo fere longiore porrecto ovato-lanceolato acuminato valde canaliculato, basin posticam versus 1-laciniatæ; bracteola basi sola connata anguste oblonga apice bifida laciniis subulato-acuminatis, integerrima rarius subincisa.

Perianthia vix emersa ovali-vel obovato-fusiformia alte tetraquetra rostellata, facie antica sæpe sulcata, demum 4-fida, valvulis lanceolatis cuspidatis. Calyptra pyriformis tenuis, solum basi tubulari 2 cell. crassa, demum bivalvatim rupta. Capsula in pedicello brevi arcuante, e perianthio lateraliter emergens, globosa 4-loba. Elateres validi rubri unispiri. Sporæ majusculæ.

Andrœcia axillaria compresso-globosa oligophylla.

Var. *Crossii*. Submajor pallide viridis tenerrima. Foliola submajora, basi distincte cordata margineque recurva, dentibus apicis sæpe apiculatis. *Hab.* juxta *Popayau*.

Fr. tetraptera Mont. (Syn. Hep. 429) nostræ subsimilis, differt præcipue lobulis basi truncatis.

16. FRULLANIA SEMICONNATA, Lindng. et G.

Syn. Hep. p. 776.

Hab. Andes Quitenses, ad arbores præcipue pomiferas, alt. 1500–3400^{m}; prope *Quito*, alt. 3000^{m}, in hortis, ad truncos ramulosque *Amygdali Persicæ*, *Pyri Cydoniæ*, præcipue vero *Pyri Mali*, haud infrequens.

F 1·1 × ·9, 1·2 × 1·0, *lob* ·5, *c* $\frac{1}{50}$; f^{la} ·6 × ·6, ·75 × ·7; *br* 1·8; per 3·0 × 1·3^{mm}.

Humilis subcæspitosa e viridi badia. Caules 2–3-pollicares tenues vage subpinnatim bis ramosi, inferne denudati.

Folia imbricata valde oblique rotundo-oblonga, basi antica profunde semicordata caulemque late transeuntia, e margine toto incurvulo concava; lobulus plus duplo brevior saccatus late obovato-semiglobosus, ore truncato; cellulæ parvæ æquilateræ, subbasales mediæ multo majores, flavidæ, pariete ad angulos lateraque incrassato.

Foliola foliis dimidio breviora contigua obovato-orbiculata, margine basali recurvo, apice brevi-emarginata, sinu dentibusque acutis.

Flores monoici: ♀ terminales. Bracteæ 2–3-jugæ majusculæ, intimæ in excipulum alte connatæ, lobis anticis patulo-recurvis obtusis apiculatisve, lobulis ovatis acuminatis segmentisque bracteolæ breviter bifidæ angustioribus basin versus sæpe lacinula una alterave auctis.

Perianthia magna, foliis caulinis fere 3plo longiora a basi subangustiore rectangulari-oblonga tetraquetra subcompressa, rotundato-truncata, rostellata, facie antica latiore unisulca.

Andrœcia lateralia, folium caulinum superantia ; bracteæ sub 5-jugæ.

Var. *suborbiculata* S., foliis foliolisque fere orbiculatis, bractearum lobis interdum tenui-apiculatis. *Hab.* infra *Banos.* in fruticum hortensium ramulis ; in M. Altar, ad *Buddlejæ* truncos.—Forma in Andibus Quit. a Jameson lecta folia habet submajora basi distincte subcordata ; alia perianthia inordinate elongata, in sicco fere subulata. —Formæ a typo paulo divergentes in Mexico quoque a cl. Liebmann lectæ fuerunt (V. Gottsch. Mex. Leverm.).

Obs. Caulis teres, extus rufo-fuscus opacus, intus pallidus, cellulis pluristratis subæqualibus conflatus. Cellulæ folii subapicales, necnon auriculæ anticæ, lobuli et folioli, iis medii folii duplo saltem minores. Cellulæ paucæ lobi mediam basin versus magnæ, flavidæ, ocellum irregularem sistunt.

17. FRULLANIA SUBALPINA, Spruce.

Hab. M. *Pichincha*, supra pagum *Nono*, alt. 3350^{m}, in rupibus humidis supra alias hepaticas repens.

F ·75 × ·7, *lob* ·3, *c* $\frac{1}{50}$; f^{la} ·4 × ·3 ; *br* 1·3 ; *per* 1·8 × 1·0^{mm}.

Pusilla olivacea. Caules vix semipollicares arcte repentes vage subramosi rarius brevibus paucifoliis.

Folia infima parva, superiora increscentia, subimbricata caviuscula late ovata, rotundata, basi antica dilatata caulem late transeuntia (neque semper semicordata) ; lobulus plus duplo brevior cauli subcontiguus galeatus subsemiglobosus, ore truncato ; cellulæ parvæ æquilateræ subconformes.

Foliola duplo breviora dissita, basi reflexa apice incurva, obovato-cuneata emarginata, sinu triangulari foliolo 6plo breviore, medio tergo radicellifera.

Flores monoici : ♀ terminales. Bracteæ 3-jugæ, intimæ foliis fere duplo longiores recurvæ fere liberæ, ad medium usque bilobæ, lobo obovato rotundato, lobulo perpaulo minore rhombeo subacuto ; bracteola oblonga—sæpe subpanduriformis—emarginata, hinc cum bractea basi connata, hinc libera.

Perianthia bracteas superantia, pyriformia vel obovato-oblonga, retusa vel obcordato rostellata, compressula tetraquetra, carinulis utrique faciei superadditis 10-carinata-plicatave, carinis undulatis lævibus.

Andrœcia folium caulinum excedentia, bracteis sub 5-jugis.

Fr. pluricarinata, Gottsch. Hep. Nov. Gran. 74, nostræ certe peraffinis, differt sec. auctoris descriptionem foliis suborbiculatis ; foliolis contiguis ad $\frac{1}{4}$ (nec ad $\frac{1}{6}$ solum) bifidis ; involucro inter lobulos et bracteolam utrinque lacinula aucto, cum bracteola alte connato.

Fr. arietina, Tayl., cui etiam subinde adveniunt perianthia pluricarinata, differt lobulis apice solo galeatis, basi in appendiculam galeæ æquilongam productis ; foliolis orbiculatis ; bracteis cum bracteola utrinque alte connatis, etc.

Fr. semiconnata, L. et G., omnium affinissima, certe distare videtur statura elatiore ; foliis majoribus oblongo-rotundis nec ovatis ; foliolis fere orbiculatis, præcipue autem bracteis in excipulum alte connatis, cuspidatis ; et perianthiis prælongis tetraquetro-prismaticis, carinis intercalatis nullis.

Obs. The perianths of *Fr. subalpina* are tetraquetrous, trapezoidal on the section, the antical face (which is much the broadest) being triplicate, and the other three faces traversed by a single medial fold, making the entire number of folds, or keels, *ten*, as in *Fr. Arecæ* and *hians*. *Fr. arietina*, which has very rarely similar supplementary folds, differs essentially in the appendiculate leaf-lobule; in other words the lobule is galeato-saccate in its upper half, while the lower half is a flat lamina, appended (as it were) to the sac. But in *Fr. subalpina* the lobule is simply a galeate sac, with a truncate mouth, and no explanate appendage.

18. FRULLANIA STENOSTIPA, Spruce.

Hab. *Pichincha*, ad cortices, alt. 3000^{m}.

F ·8 × ·65, *lob* 35, *c* $\frac{1}{44}$; f^{la} ·6 × ·3, ·55 × ·25; *br* 1·5; br^{la} 1.2; *per* 2·0 × ·85^{mm}.

Pusilla (pollicaris) viridis subinde rufescens, *Fr. semiconnatæ* affinis, differt an specifice? caracteribus sequentibus :—

Folia minora subimbricata planiuscula, oblique cordato-oblonga-ovatave; lobulo lobo plus duplo breviore cucullato erostri, inferne in laminam brevem deorsum sensim angustatam protracto—raro galeato et fere æqualiter truncato.

Foliola paulo breviora, plus duplo angustiora, ligulato-oblonga vel anguste cuneato-obvata—e medio margine utrinque valide recurvo ad speciem panduriformia, repanda, apice ad $\frac{1}{6}$–$\frac{1}{5}$ alt. subacute bifida, segmentis acutis.

Flores ♀ dioici (?): Bracteæ 3–4-jugæ, intimæ (saltem) in excipulum obpyramidatum, alte connatæ foliis subduplo longiores, fere æqualiter bilobæ, lobis oblongis acute acuminulatis repandis, antico recurvo, postico (lobulo) suberecto margine plus minus incurvo, basin internam versus-laciniato; bracteola brevior ovato-lanceolata breviter bifida.

Perianthia pyriformi-oblonga rostellata 4–5-carinata.

Obs. Pauca exemplaria inveni, omnia mere fœminea, nulla monoica.—*Fr. semiconnata* flores habet monoicos; foliorum lobulum galeato-saccatum ore truncatum; foliola majora, tam lata quam longa, suborbiculata; perianthia fere rectilineari-oblonga tetraquetra.

19. FRULLANIA FLAMMEA, Tayl.

Tayl. Mst. in hb. Jameson.

Hab. In Andibus Quitensibus prope *Cuenca*, ubi ad arbores legit JAMESON.

F ·85 × ·75, *lob* ·35 × ·35, *c* $\frac{1}{40}$; f^{la} ·40 × ·35, *br* 1·0^{mm}.

Pusilla, facie *Fr. fragilifoliæ*, atrosanguinea. Caules ½–1-pollicares teneri implexi irregulariter pinnati.

Folia imbricata dissitave late oblique cordato-ovato-triangularia obtusata obtusa vel raro subacuta; lobulus plus duplo brevior, basi cauli contiguus, oblique ascendens, galeatus, oblongo-hemisphœricus truncatus—subinde apice solo cucullatus, basi ad speciem in lamellam productus; cellulæ parvulæ, pariete incrassato, opacæ, basales majores pellucidæ.

Folia parva late ovali-cuneata breviter acute bifida, dorso gibbo radicellarum penicillum gerentia, margine plano angulato.

Flores dioici : ♀ terminales digyni. Bracteæ 1–2-jugæ foliis submajores suberectæ ad $\frac{1}{3}$ alt. bilobæ, complicatæ, lobis acutis obtusisve canaliculatis, postico paulo minore, subrecurvo ; bracteola angusta (imperfecta solum visa).

Amenta ♂ folio axillari breviora vel sublongiora ; bracteæ 3–5-jugæ.

Fr. Cuencensis Tayl., Lond. Journ. Bot. 1846, p. 406, in eadem vicinia lecta, differre certe videtur foliis foliolisque majoribus rotundioribus, margine recurvis.

Obs. Fr. flammea, cum duabus sequentibus (*Fr. decidua* et *Fr. Orinocensis*) melius forsan inter *Trachycoleas* militaverint.

20. FRULLANIA DECIDUA, Spruce.

Hab. Andes Quitenses, in valle *Alausi*, ad saxa.

F ·8 × ·7, ·8 × ·6, *lob* ·3–·25 × ·2, *c* $\frac{1}{10}$; *f*^{la} ·33 × ·3^{mm}.

Prostrata substratificata, ex atro rubella. Caules 2–3-pollicares subsimplices teneri pallidi inter se paralleli, sæpe e foliis caducis fere denudati.

Folia subimbricata vel dissita oblique patula late cordato-ovata asymmetrica, apice decurvo rotundata ; lobulus subtriplo brevior, subobliquus, oblongus—interdum brevi-cylindraceus—galeatus basi tumcatus, vel persæpe solum apice cucullatus; cellulæ parvæ rotundæ, omnes fere æquimagnæ, paucæ basin versus sensim submajores.

Foliola dissita foliis plus duplo minora ovali-rotunda acute emarginata, dentibus acutis.

Flores haud visi.

Fr. flammea Tayl., colore similis, differt caule multo breviore, magis ramosa ; foliis solum obtusis, lobulo duplo fere latiore.—*Fr. Cuencensis* Tayl., foliolis majoribus et foliorum cellulis minutis densis in peripheria, magnis in centro, diversa est.

21. FRULLANIA ORINOCENSIS, Spruce.

Hab. Maypures fluminis *Orinoco*, in cortice.

F 1·1 × ·85, *lob* 3, e $\frac{1}{5}$; *f*^{la} ·35 × ·25 ; *br* 1·2 ; *br*^{la} ·75 × ·25 ; *per* 1·3 × 1·0^{mm}.

Prostrata rufo-sanguinea laxe intricata. Caules pollicares, validi, laxe subramosi.

Folia subimbricata semicordato-ovata rotundata obtusatave ; lobulus sub 4plo brevior sæpissime evolutus ovato-subulatus lingulatusve, raro cucullatus, basi cauli contiguus, superne angulo 30°–40° divergens ; cellulæ parvæ æquilatere subconformes subopacæ.

Foliola dissita foliis plus quam triplo breviora, latitudine caulem haud transeuntia, cuneato-oblonga, ad $\frac{1}{2}$ bifida, segmentis lanceolatis sinuque acutis, fere planissima.

Flores monoici : ♀ terminales. Bracteæ sub 4-jugæ, decurvo-secunda, intimæ foliis sublongiores oblique ovato-oblongæ obtusæ, lobulo ejusdem longitudinis licet angustiore subacuminato acuto, integerrimæ, basi autem (inter bracteam et bracteolam) lacinula dentiformi

auctæ; bracteola hinc cum bractea breviter connata, brevior, angusta, ligulata, vix ad medium acute bifida, segmentis erectis acutis.—Ramuli (sive innovationes) axillares alterni e quoque bractearum pari, intimo excepto, proferuntur.

Perianthia subemersa oblongo-globosa inflata, parum compressa, antice subconvexa, postice bicarinata, carinis subrugulosis.

Androecia ramulo folium proximum vix superante constantia oblongo-globosa; bracteæ 4–5-jugæ.

Obs. Inter *Fr. trinervis* L. et L. varietates forsan jam antea enumerata, a typo tamen certe specifice differt.

Fr. tetraptera Mont. Ann. Sc. Nat. 1838, nostræ sat similis, differt foliis solum obtusis; foliolis majoribus suborbiculatis, et bracteis dentatis.

Fr. laxiflora S., habitu coloreque subsimilis, lobulum habet duplo majorem apice galeatum basi longe appendiculatum; foliola duplo majora ad ¼ solum bifida.

Fr. inflata Gotts. Syn. Hep. 424, affinis videtur, differt autem lobulo majusculo a caule distante. (Amer. bor. habitat.)

Fr. spicata L. et L. (e Brasilia) folia habet orbiculata; foliola obovata apice solo bifida.

SUBGENUS II.—*TRACHYCOLEA*, S.

Plantæ humiles prostratæ arcte repentes, plerumque in orbem radiatim dispositæ, rarissime substratificatæ, vage pinnatim ramosæ, viridiores quam cæteræ Frullaniæ, deinde luride rufescentes; perianthia sæpe albicantia raro apice purpurascentia.

Folia fragilia, sæpe squarroso-recurva, oblique cordato-ovata rotundata; lobulus plerumque parvus, alte galeatus, ore truncato, interdum explanatus, basi cauli contiguus, rectus v. subobliquus; cellulæ parvæ subopacæ, inferiores majores.

Foliola dimidium folium fere semper excedentia, subrotunda cuneatave, breviter bifida, rarissime integra, subinde utrinque angulato-1–2-denticulata.

Flores dioici: ♀ terminales. Bracteæ paucijugæ, intimæ foliis subæquilongæ, lobulis bracteolisque pro more laciniatis.

Perianthia emersa sæpe subobovata compressa tricarinata, interdum antice (rarius etiam postice) 1–4-carinulata, facie fere tota tuberculis, villis vel squamulis plerumque conspersa, rarissime subnuda.

Androecia primum globosa, serius plerumque elongata et subcylindrica; bracteæ plurijugæ diandræ.

Hab. Ad arborum truncos et ramulos sæpeque ad saxa, locis montium inferiorum planitieique subsylvaticis, vix unquam in subalpinis.

Distr. Species haud numerosæ, nullo climate omnino exules. Una (*Fr. dilatata*) per zonam temperatam borealem vulgata, in Europa fere sola sui subgeneris est, altera specie, *Fr. Jackii* Gotts., foliolis integris insigni, rarissima; in America boreali autem aliæ paucæ species inveniuntur. In hemisphæra australi temperata et frigida aliæ species, omnes propriæ, adveniunt; aliæ plures terris tropicis propriæ sunt, earumque una, *Fr. squarrosa* Nees, in America, Asia et Africa, tropica et subtropica, late distributa est. In America æquatoriali ipse solum

4 species, nullam vulgatam, inveni. *Fr. squarrosa* per sylvam Amazonicam et Andes inferiores dispersa est, nusquam ab habitationibus remota, sæpeque *Fr. gibbosa* et *arietina* consociata. Cæteræ 3 omnes zonam Andium sylvaticam inter 1200 et 2000^{m} alt. incolunt. Aliæ species in Mexico, Antillis, Brasilia, etc. habitant; in Asia tropica et Africa tamen rariores videntur.

In this subgenus, as in all the following ones, the perianth is typically trigonous, having two lateral and only one postical keel; although in *Trachycolea* supplementary ridges (carinulæ) are sometimes added on at front and back; it is moreover beset with tubercles, or papillæ, or leafy scales, which rarely become obsolete. In the tropical species it is nearly always whitish-green, rarely passing to dull purple at the apex, while the foliage is green, and not rufous, as in most other Frullaniæ. Our own *Fr. dilatata* is the type of the group, but is nearly always tinged with brown on both foliage and perianth. The species grow either in orbicular patches on stones and trees, or trail over other hepaticæ. *Fr. squarrosa* (like *Fr. dilatata*) is truly a weed, following the operations of men, and growing along with *Fr. arietina* and *gibbosa* throughout the Amazon plain and lower hills, only near habitations, where it is not uncommon on old calabash trees, but is seldom fertile. Of the other 3 species gathered by me in South America, two belong to the middle wooded region of the Andes and ascend to 1800^{m}; the third to the plain, at the cataracts of the Orinoco. They are all very local, yet have a somewhat "trivial" custom, being never found in the depths of the forest but preferring deserted clearings and such like places. In this respect they agree with *Chonanthelia*, one species of which, *Fr. Orinocensis*, also approaches them in character, but differs essentially in the 4-(not 3-) angled perianth.

Fr. squarrosa is not only tropical American but is found also in South Africa, in continental India and the Malay Islands, and in Australia. *Fr. ericoides* Nees, which is scarcely distinct from the preceding, is also common to the three continents, and has been found in some of the Oceanic Islands. A few other species are described from the southern hemisphere, some from as far south as New Zealand and Cape Horn. In Europe, besides *Fr. dilatata*, we have one, or perhaps two, species. North America, with *Fr. dilatata*, has *Fr. œolotis*, *Fr. Virginica*, and two or three others.

All the species of *Trachycolea* part rapidly with their colouring matter when moistened, and tinge water yellowish-green.

22. *Fr. squarrosa.*—F. fragilissima recurvo-squarrosa cordato-ovata rotundata, lobulo majusculo galeato. Foliola vix minora oblato-orbiculata angulata ad $\frac{1}{3}$ bifida, segmentis apiculatis. Br. lobulis laciniatis; bracteola subdentata. Per. oblongo-obovata retusa, supra medium plus minus papillosa.
23. *Fr. squamuligera.*—F. vix fragilia squarrosa late semicordato-ovata rotundata, lobulo minuto galeato. Foliola haud duplo breviora oblato-orbiculata brevi-emarginata, dentibus subacutis. Br. lobulis bracteolaque laciniatis. Per. oblonga rotundata, facie fere tota squamulis foliaceis vestita.
24. *Fr. latiflora.*—F. vix fragilia subsquarrosa, lobulo parvo obtuse conico. Foliola fere duplo breviora obovato-rotunda ad $\frac{1}{4}$ bifida, segmentis

subacutis. Br. integerrimæ, nisi pro lacinula una alterave in sinu inter lobulos et bracteolam connatam. Per. fere orbiculata alte triquetra, carinis rudimentarie alatis scaberulis, cæterum lævissima.

25. *Fr. hirtiflora.*—Tenella. F. haud squarrosa, valde inæquilatera semicordata obovato-oblonga rotundata, lobulo triplo breviore cylindrico-galeato. Foliola fere duplo minora cuneata utrinque 1–2-dentata, apice ad $\frac{1}{4}$–$\frac{1}{3}$ bifida, laciniis acutis. Br. lobulis basi externa, bracteolaque utraque basi, 1-laciniatis. Per. alte emersa obovata compresso-trigona, facie tam antica quam postica obtuse 4-plicata ubique papillis longis articulatis hirta.

22. FRULLANIA SQUARROSA, Nees.

Jungermania squarrosa N. in Nov. Act. Acad. Nat. Cur. XI. ; *Frullania squarrosa* ejusd. Syn. Hep., 416.

Hab. Per planitiem Amazonicam sparsa, semper juxta habitationes, ad arbores saxave ; etiam in Andibus occidentalibus, (*Tarapoto Baños*, etc.) ad 2000 metr. alt. ascendens.

F ·75 × ·6, ·7 × ·6, *lob* 4, *c* $\frac{1}{50}$; f^{la} ·6 × ·7 ; *br* 1·2 ; *per* 2·0 × 1·2^{mm}.

Viridis, in plagas latas extensa ; caules implexi ope radicellarum arcte repentes 1–2-pollicares pinnati, ramis brevibus inæquilongis, interdum subbipinnati.

Folia fragilissima dense imbricata, margine supero recurvo-squarrosa, oblique cordato-ovata rotundata, lobulo majusculo cauli contiguo galeato, ore obliquo, interdum evoluto vel solum cucullato ; cellulæ parvæ, mediæ subbasilares multo laxiores.

Foliola foliis æquimagna oblato-orbiculata planiuscula ad $\frac{1}{3}$ acute bifida, segmentis apiculatis, basi angustissime subdecurrentia, margine sinuato-angulata.

Flores dioici : ♀ terminales. Bracteæ foliis majores complicato-bilobæ, lobo integro, lobulo laciniato ; bracteola oblonga bifida, lobis acuminulatis repandis, angulato-dentatis vel incisis, utrinque supra basin 1-laciniata.

Perianthia semiemersa oblongo-subobovata retusa rostellata, triquetra, carina postica prælta, facie antica unisulca (s. 2-carinulata), tota superficie, dimidio superiore, ad carinas præcipue sparse tuberculosa vel brevi-papillosa.

Ad *San Carlos del Rio Negro* advenit forma foliis fere orbiculatis, foliolis minoribus (=folii $\frac{2}{3}$) ; eadem fere forma ad Baños (montis Tunguragua). Cum *Fr. squarrosa*, a G. A. Lindberg in Brasilia australi lecta, bene convenit.

23. FRULLANIA SQUAMULIGERA, Spruce.

Hab. Andes Quitenses, in sepibus juxta cataractam *Agoyan*.

F 1·25 × 1·1, *lob* ·25, *c* $\frac{1}{40}$; f^{la} ·7 × ·8 ; *br* 1·8 ; *per* 3·0 × 1·2^{mm}.

Caules 2-pollicares prostrati debiles inæqualiter ramosi, subbipinnati.

Folia inferiora fuscidula, superiora pallide viridia, vix fragilia, imbricata, squarrose patula, late semicordato-ovata, apice rotundata, auricula antica circinata caulem transeunte ; lobulus minutus, folio 5-plo

minor, suberectus cauli contiguus galeatus vel compresso-companulatus ; cellulæ parvulæ pallidæ opacæ, pariete sinuoso-incrassato, intus profunde stellatæ.

Foliola contigua foliis haud duplo breviora oblato-orbiculata brevi-emarginata, sinu dentibusque acutis obtusisve, basi subangustata amplexantia.

Flores dioici : ♀ in ramo sæpe abbreviato terminales. Bracteæ intimæ foliis diimdio longiores subpatulæ, lobo oblongo rotundato, lobulis bracteolaque angusta bifida connata laciniatis vel spinoso-serratis.

Perianthia viridia semiemersa rectangulari-oblonga ex apice rotundato longirostria acute triquetra, antice obtuse 1-carinulata, facie tota (basi apiceque lævibus exceptis), ad carinas præcipue squamulosa, squamulis pallidis foliaceis, subulatis vel ovato-lanceolatis, integris vel varie laciniatis.

A *F. laciniosa*, Lehm. ; 'Syn. Hep.' 415, insula Java oriunda, distincta lobulis parvis et perianthiis facie antica 1-(nec 3-) striatis. A *F. squarrosa* Nees differt foliis dimidio majoribus vix obliquis, lobulis duplo minoribus ; foliolis pro ratione multo minoribus brevi-emarginatis (nec ad $\frac{1}{3}$ usque bifidis) ; perianthiisque dimidio longioribus squamosis (nec solum papillosis).

24. FRULLANIA LATIFLORA, Spruce.

Hab. Ad cataractam *Maypures* fluminis *Orinoco* in cortice.

F ·8 × ·66, *lob* ·2–·25, *c* $\frac{1}{10}$; *fta* ·4 × ·4, ·5 × ·55 ; *br* ·9 ; *br*^{la} ·9 × ·85 (*explanata*) ; *per* 1·6 × 1·5mm.

Viridis prostrata subimplexa ; caules pollicares vage ramosi.

Folia (parum fragilia) imbricata, plus minus squarroso-recurva, oblique cordato-ovata rotundata ; lobulus fere 4plo brevior cauli subcontiguus galeatus (obtuse conicus v. extinctoriiformis) ore horizontali ; cellulæ pallidæ sed opacæ parvulæ subconformes.

Foliola contigua foliis fere duplo breviora obovato-rotunda ad $\frac{1}{4}$ obtuse bifida, segmentis subacutis, subplana undulatave, basi margine leniter reflexa unde subcuneata videantur, integerrima vel (superiora (augulato-denticulata.

Fl. *dioici* : ♀ terminales ; bracteæ intimæ foliis c. vix longiores carinatæ, bifidæ, lobo antico paulo majore obtuso, lobulo ovato-lanceolato subacuminato ; bracteola utrinque altiuscule connata, (lacinula una alterave in sinu) carinata bifida, segmentis forma magnitudineque lobulorum.

Perianthia foliis fere duplo longiora albida *obovato-orbiculata* triquetra carinis dilatatis compressis rudimentarie alatis, ala eroso-denticulata, *cæterum lævissima* nec papillosa ; facie antica vel convexula vel 1-carinulata, postica loco carinæ unicæ validæ adsunt raro carinæ 3 minores.

F. squarrosa, Nees, huic peraffinis, differt lobulis subduplo majoribus ; *ore obliquo* ; foliolis multo latioribus dentibus apiculatis, et perianthiis oblongis tuberculosis.

25. FRULLANIA HIRTIFLORA, Spruce.

Hab. Baños, ad pedem montis *Tunguragua,* alt. 1800^{m}, in imis truncis et saxis.

F ·9 × ·6, *lob* ·3–·35, *c* $\frac{1}{4-8}$; f^{la} ·5 × ·3 ; *br* 1·25 ; *per* 2·5 × 1·25^{mm}.

Tenella pallide viridis. Caules pollicares prostrati implexi vage vel subpinnatim bis terve divisi.

Folia tenera subimbricata convexa obovato-oblonga rotundata, valde inæquilatera, basi antica semicordata caulem late transeuntia ; lobulus 3plo fere brevior cylindraceo-galeatus, basi cauli contiguus, subobliquus ; cellulæ parvæ pallidæ opaculæ, omnes fere æquimagnæ.

Foliola subdistantia foliis fere duplo breviora cuneata, ad $\frac{1}{4}$–$\frac{1}{3}$ acute bifida, laciniis acutis, medio margine utrinque angulato-1–2-dentata, radicellis rubris stellato-patulis.

Flores dioici : ♀ terminales. Bracteæ intimæ foliis majores, brevissime connatæ, lobo superne recurvo rotundato integerrimo, lobulo acuminato repando basi 1-laciniato ; bracteola bifida, segmentis acuminatis repandis v. subincisis, basi utrinque sæpe 1-laciniata.

Perianthia alta emersa obovata compresso-trigona ex apice retuso longe rostellata, facie tam antica quam postica obtuse 4-plicata-striatave, papillis longis (villisve) sæpe hamatis ubique (ad liras præcipue) hirsuta, demum apice trifida. Villi 8-cellulas longi, cellulam unicam, vel basin versus 2- (raro 3-) cellulas lati.

Fr. Lindbergiana, G.! Mex. Leverm. p. 240, in adnot., a cl. G. A. Lindberg in Brasilia australi lecta, differt foliis foliolisque latioribus suborbiculatis, lobulo multo majore (=$\frac{1}{2}$–$\frac{2}{3}$ folii, nec solum $\frac{1}{3}$ ac in nostra) ; involucris serrulatis spinulosisve ; et perianthio ovali-triquetro esulcato, quamvis tam hirto quam *Fr. hirtiflorœ.—F. tuberculata* L. et L. cum nostra foliolis parvis cuneatis angulato-dentatis fere congruit, distincta tamen foliis parum inæquilateris, oblongis nec obovatis, cellulis basalibus magnis in orbem dispositis, et perianthiis esulcatis minus papillosis.

SUBGENUS III.—*HOMOTROPANTHA,* S.

Plantæ robustæ speciosæ tripinnatæ stratificatæ.

Folia conferta patulo-decurva, siccando devoluta, cordato-suborbiculata, lobulo minuto conchæformi, cucullato vel sæpius clavato-saccato, cauli contiguo, in plurimis reflexo ; cellulæ mediocres intus 6-sinuatæ.

Foliola conferta foliis vix minora orbiculata vel subreniformia emarginata, raro integra.

Flores monoici creberrimi, ad ramos ramulosque laterales, fœminei assurgenti-secundi. Bracteæ ♀ 5-jugæ, intimæ foliis sat majores, lobis latis acutis subintegerrimis, lobulis bracteolæque liberæ segmentis acuminatis plerumque laciniatis.

Perianthia breviuscula ovali-trigona, utroque fine angustiora, apice vix rostellata. Calyptra inferne 2c. crassa.
Andræcia folio axillari sublongiora ; bracteæ densæ plurijugæ.

Hab. Ad arborum et fruticum ramulos in terris calidis.
Distr. Species perpaucæ cognitæ, neque adhuc inter se bene definitæ, regiones æquatoriales, orientales præcipue, habitant ; earum una (in ditione Amazonica unica) per terras intertropicales totas dispersa, habitationum viciniam pro more diligit.

Obs. The few species composing this group have a peculiar habit, from the robust tripinnate stems and numerous lateral secund perianths The large leaves and stipules are not unlike those of the *Chonanthelieæ ;* but the minute leaf-lobules—usually reflexed and appressed to the stem —are widely different. In the trigonous perianths it agrees with *Trachycolea*, *Meteoriopsis* and *Thyopsiella*, from all of which it is separated by the monoicous inflorescence and by other characters. *Fr. replicata*, Nees in Mart. Fl. Bras. (published afterwards in 'Syn. Hep.' as *Fr. Thuillerii*—a Mst. specific name of Schwaegrichen's) is found all round the world, in countries on and near the equator ; and like *Fr. squarrosa*, *gibba*, and a few others, probably owes its wide distribution partly to the involuntary agency of man, from its almost invariably clinging to the twigs of the domesticated shrubs (such as *Crescentia Cujete*) which accompany him in his migrations. Specimens from Ceylon, Sumatra, etc., quite correspond to my S. American ones ; nor can I safely distinguish them from Javan specimens of *Fr. nodulosa*, Nees.

26. FRULLANIA REPLICATA, Nees.

Jung. replicata Nees in Mart. Fl. Bras. ; *J. Thuilleri* Schwgr. MSS., "Syn. Hep." 434.

Hab. In sylva Amazonica hic illic sparsa, habitationibus vix unquam remota, arborum domesticarum ramos infestans, locis *Pará* ; fl. *Ramos*, *Bombonasa*, *Uaupés*, etc., ripis.

F 1·25×1·25–1·4, *lob* 15, *c* $\frac{1}{3-2}$; *f*^{ta} 1·2×1·2 ; *br* 2·0 ; *per* 1·8×·9^{mm}.

Caules 3-pollicares validi, e rufo nigrescentes, arcte tripinnati, horizontaliter stratificati intricative.
Folia viridia, ætate fulva rufave dense imbricata patulo-decurva late cordato-ovata fere orbiculata, sæpius latiora quam longa ; lobulus minutus, ad caulem ramosque galeatus, cucullatus vel solum cochleatus, oblique divaricatus, ad ramulos clavato-saccatus subrecte reflexus caulique contiguus ; cellulæ mediocres æquilateræ, e pariete valde nodoso-incrassato intus 6–10-(sæpius 8-) sinuatæ, subconformes, inferiores perpaulo majores.
Foliola imbricata foliis fere æquimagna orbiculata decurrentia, ipsa basi subcordata, apice emarginata sinu triangulari, dentibus acutis vel subapiculatis, ad axin profunde canaliculata, alis superne valde reflexis.
Flores monoici crebi : ♀ laterales, plerique ramuligeni, pauci ad ramos primarios, nulli ad caulem, assurgenti-secundi. Bracteæ sub 5-jugæ, infimæ minutæ æquilobæ, superiores sensim majores late patentes

inæquilobæ complicatæ, intimæ lobo lato subacuto subintegerrimo, lobulo duplo minore bracteolæque liberæ segmentis acuminatis laciniatis.

Perianthia vix emersa ovalia trigona erostria, angulis apicem versus oreque scaberula. Calyptra perianthio vix duplo brevior obovato-pyriformis 2 cell. crassa, demum apice inæqualiter bivalvis. Capsula in pedicello brevi vix emersa, rufa sphærica profunde 4-fida, valvis recurvis. Elateres elongati angustiusculi, spiram tenuem laxe torquatam includentes.

Andrœcia ramigena subglobosa vel late ovoidea, folio axillari longiora; bracteæ plerumque plurijugæ confertissimæ.

Ad fl. *Uaupés* adest forma foliolis valde confertis reniformibus, bractearum lobulis bracteolisque margine undulato-crispis subintegerrimis.

Obs. The female branchlets are decidedly lateral, chiefly on the secondary branches, less frequently on the primary, never on the stem. They often alternate—springing first from one side of the branch, then from the other,—but as they all arch upwards, they seem, at first sight, to be seriate along the upper face of the branch.

The leaf covering the base of each branch (leafy or floriferous) is wider than the rest, and more symmetrical, while the lobule is frequently evolute and the interlobule is enlarged (oblong, acute) and subtends the underside of the branch.—This interlobular process is usually quite wanting to normal stem-leaves.

The different form of the cauline and ramuline lobules seems to almost break down the difference between *F. replicata* and the E. Indian *F. nodulosa* Nees.

SUBGENUS IV.—*METEORIOPSIS*, S.

Plantæ elatæ stratificatæ rufescentes vel fere atræ. Caules pro more penduli longissimi laxe pinnati bipinnatique, ramis breviusculis, apice ad *Meteorii* (generis Muscorum) instar indefinite crescentes.

Folia dissitiuscula, basi profunde cordata convolutivo-amplexantia, subtriangularia pro more acuminata integerrima opaca; lobulus 3–8plo brevior cauli appressus (erectus) tenuis cylindricus, rarius evolutus; cellulæ parvæ sæpe subelongatæ, pariete incrassato.

Foliola foliis subduplo breviora anguste oblonga bifida, alis interdum recurvis, margine ipso autem plano.

Flores dioici: ♀ in ramulo brevissimo insidentes, quasi-laterales. Bracteæ 3–4-jugæ, intimæ foliis plerumque sat longiores, profunde bifidæ complicatæ inæquilobæ, lobis omnibus pro more acuminatis serratis laciniatisve, raro subintegerrimis; bracteola libera segmentis subulatis.

Perianthia trigona longirostria lævia. Calyptra inferne 4 c. crassa.

Andrœcia vel ramulo folium axillare subexcedente constantia vel rarius in ramo terminalia.

Hab. Ad arborum ramos et folia necnon ad saxa in sylvis montium tropicalium opacis, ad crinis pulcherrimi instar longe pendula, muscis

simili habitu (*Meteoriis, Phyllogoniis*, etc.) persæpe consociata ; rarius etiam ad filices.

Distr. Species paucæ nobis cognitæ inter tropicos totius orbis vigent. Ipse in Andium Quitensium et Peruvianorum devexis sylvaticis 4 species solum legi, quarum una, *Fr. atrata Sw.*, a Mexico et ins. Antillarum ad Brasiliam australem dispersa est.

Obs. Melius forsan pro subgeneris sequentis sectione habenda, differt autem a *Thyopsiellis cladocarpicis* caule indefinite elongato, foliis basi utrinque cordatis (nec solum antice semicordatis) caule circumvolutis, et foliolis angustis.

The few species composing this group inhabit only the dampest hill-forests in tropical America, growing on rocks and the branches of trees, from which one of them, *Fr. atrata* Sw., depends in huge masses, sometimes half-a-yard long, and too bulky to be grasped in the arms. Its black-purple hue is often relieved by the admixture of mosses of similar pendulous habit, especially bright-green *Meteoria*, and silvery or golden *Phyllogonia*. It is found from the West Indies and Mexico to Southern Brazil and Peru, but I never met with it (nor with any other of the group) in the plains ; wherefore I suspect that it has been erroneously indicated as growing on the Amazon and Orinoco.

With *Meteoriopsis* might have been combined the cladocarpous species of the following subgenus (*Thyopsiella*) ; the latter, however, differ in the definite stems and consequently more compact habit ; in the semi-cordate leaves (not equably cordate, or auricled on each side of the base) which are not convolute when fresh ; and in the much larger and wider underleaves, with recurved or revolute margins. Otherwise, along with *Meteoriopsis*, they might rank as a mere section of *Thyopsiella*.

27. *Fr. atrata.*—Atro-rubens longissima laxe subbipinnata. F. cordato-ovata acuminulata acuta, lobulo 4plo breviore tenui, c. mediis elongatis. Foliola (=folii $\frac{5}{8}$) ovali-lanceolata breviter bifida segmentis acutis. Br. intimæ foliis duplo longiores acuminatæ subserratæ recurvæ. Per. vix emersa ovato-fusiformia sensim longirostria.

28. *Fr. atrosanguinea.*—Priori similis, flaccidior, colore saturate sanguineo ; foliis solum acutis—interdum obtusis, cellulis conformibus ; foliolis majoribus ; br. folia vix æquantibus haud acuminatis, lobulis ciliato-laciniatis ; per. emersis ex apice lato abrupte longirostribus, differt.

29. *Fr. Peruviana.*—Pallide viridis. F. cordato-ovata triangularia acuminulata, margine interdum lenissime recurvulo, lobulo 3plo breviore sæpe evoluto. Foliola 2plo breviora oblonga ad $\frac{1}{3}$ bifida, segmentis acutis. Br. foliis longiores, lobis inciso-serratis, lobulis 2-plo angustioribus prælongis segmentisque bracteolæ complicatæ sublaciniatis. Per. ovali-fusiformia rostello prælongo solo emersa.

30. *Fr. aculeata.*—Atro-rubens minus elongata. F. biauriculato-cordata triangularia setaceo-acuminata, lobulo præminuto tenui, c. omnibus elongatis. Foliola plus duplo breviora lineari-oblonga ad $\frac{1}{2}$ bifida, segmentis subulato-setaceis. Br. foliis longiores bracteolaque bipartitæ, segmentis longe setaceo-acuminatis subintegerrimis. Per. immersa triquetro-fusiformia longissime rostrata.

27. FRULLANIA ATRATA (Sw.).

Jung. atrata Sw. Prodr. Flor. Ind. occ. 144 ; *Frullania a.* Nees, 'Syn. Hep', 464.

Hab. In Andium Quitensium sylvis montanis, supra montes *Tunguragua* et *Guayrapata* præcipue, alt. circiter 3000m. ex arborum ramis pendula; in planitie nusquam vidi; ad flumina Amazonum et Orinoco tamen in 'Syn. Hep.' (per errorem *l*) indicata est. Cæterum, in montibus totius fere Americæ tropicæ haud raro ocurrit.

F 1·2×·9, *lob* ·3, *c* $\frac{1}{55}$—$\frac{1}{40}$; f^{la} ·75×·35, ·75×·3; *br* 2·5–3·0; *per* 2·5×·75mm.

Caules longissimi, pedales vel etiam bipedales, capilliformes, laxe symmetrice pinnati et bipinnati, in fasces magnos nigrescentes pendulos coacervati.

Folia subimbricata dissitave e rubro atra opaca cauli circumvoluta late cordato-ovata acuminulata apiculatave acuta integerrima interdum repandula; lobulus 4plo brevior cauli contiguus parallelusque tenui-cylindricus; cellulæ parvæ, mediæ subelongatæ, cæteræ subquilateræ, pariete incrassato.

Foliola dimidio folio longiora ovali-lanceolata (ex alis recurvis lineari-oblonga videntur) breviter bifida, sinu tenui, segmentis acutis margine recurvis.

Flores dioici: ♀ in ramulo valde abbreviato terminales, quasi laterales. Bracteæ 3–4-jugæ, extimæ parvæ, intimæ foliis caulinis 2plo et ultra longiores, basi erectæ, apice plus minus squarroso-recurvæ liberæ subserratæ complicato-bilobæ, lobis oblique lanceolatis acuminatis, lobulis bracteolæque complicatæ laciniis apice subulatis. Infra florem pro more adveniunt folia 1–3-juga minuta normaliter saccato-lobulata.

Perianthia vix emersa nigra anguste ovato-fusiformia trigona in rostellum longum subsensim attenuata. Calyptra duplo brevior, brevi-pyriformis albida, infra medium 4 c. crassa, apice demum inæqualiter 4-valvis. Pedicellus perianthio vix longior, infra perianthii apicem rima laterali emergens, albidus opacus, cellulis angustis conformibus conflatus. Capsula globosa rufo-badia, profunde 4-valvis, cellulis bistratis, exterioribus latioribus intus nodosis, interioribus fibra spirali carentibus; elateres capsula vix duplo breviores, valvularum dimidio supero adfixi, late unispiri, demum (capsula evacuata) devexi. Sporæ magnæ elateribus plus duplo latiores angulatæ rufo-tuberculosæ.

Plantæ masculæ tenuiores. Andrœcia ramulo minuto constantia, oblongo-globosa subcompressa folium axillare paulo excedentia; bracteæ 3–jugæ.

Obs. The ♀ flowers are secondary branches of the distantly bipinnate stem, so much shortened that all the leaves on them are (mostly) to be accounted bracts.

28. FRULLANIA ATROSANGUINEA, Tayl. in hb. Jameson.

Hab. in monte *Pichincha*, ubi plantas ♀ et ♂ legit beat. JAMESON; ipse in montibus *Tunguragua* et *Guayrapata* sterilem solum legi.

F 1·7×1·5, *lob* ·5×·15, *c* $\frac{1}{60}$—$\frac{1}{45}$; f^{la} 1·3×·8; *br* 1·5; *per* 2·15×·75, *rostellum* ·35mm.

Caules penduli pedales debiles flexuosi, laxe et fere simpliciter pinnati, ramulis perraris, (cum foliis) sanguineo-rubentes, apicibus novellis flavidi.

Folia dissita cauli circumvoluta cordato-ovata, acuta apiculata vel subobtusa, basi fere symmetrica, auriculis rotundatis, postica submajore e sinu (cauli contiguo) lobulum folio 3plo breviorem erectum clavatum compressulum proferente; cellulæ parvæ subconformes subæquilateræ, pariete incrassato, foliolorum pallidæ elongatæ.

Foliola foliis haud multo breviora pallida ovato-lanceolata, subacuta breviter (ad $\frac{1}{6}$) bifida, alis recurvulis, segmentis contiguis acutis subplanis.

Flores dioici: ♀ laterales. Bracteæ intimæ foliis caulinis subminores inæquilobæ, lobo ovali apiculato-acuto, lobulo ovato-lanceolato acuminato ciliato; bracteola bracteis æquilonga laciniato-ciliata complicato-biloba, lobis lanceolato-subulatis flexuoso-acuminatis.

Perianthia semiemersa obovato-oblonga, subtriplo longiora quam lata, ex apice lato abrupte longirostria, demum trifida. Capsula globosa 4-partita vix emersa.

Amenta ♂ ramigena, folio axillari duplo longiora oblonga compressula; bracteæ 6-jugæ arcte equitantes cymbiformes, lobis subæqualibus semilunato-obovatis ultra medium connatis. Bracteola una alterave, parva biloba, ad amenti basin adest; cæteræ bracteolæ obsoletæ.

A *F. atrata* certe diversa videtur habitu flaccidiore, colore sanguineo; foliis majoribus haud acuminatis—interdum obtusis, cellulis mediis haud elongatis; foliolis longioribus; bracteis longe brevioribus, lobis haud acuminatis, lobulis ciliato-laciniatis; præcipue autem perianthio ex apice lato rotundato longirostri.

29. FRULLANIA PERUVIANA, Gottsche.

G. L. et N. 'Syn. Hep.' 465.

In M. *Guayrapurina* Andium Peruvianorum, e rupibus arboribusque pendula, necnon in filice repens. "Peruvia," 'Syn. Hepat.' l. c.

F 1·0×·7, ·85×·6, *lob* ·3; *f^la* ·5×·3; 4×2; 4×·18; *br* 1·7; *per* 2·2×·85, *rostellum* ·6; c $\frac{1}{60}$—$\frac{1}{50}$ mm.

Caules usque ad 12 pollices longi, tenuissimi, in cæspites magnos, pallide virides flavidosve pendulos imbricati, laxe bipinnati, ramulis sæpe fere capillaceo-attenuatis.

Folia dissita suboblique cordato-ovato-triangularia acuminulata apiculatave acuta, basi antica caulem late transeuntia convolutiva, cæterum subplana, vel margine lenissime recurvulo; lobulus 3plo brevior semper fere evolutus subulatus, raro saccatus subcylindricus cauli subcontiguus; cellulæ minutulæ subelongatæ flexuosæ pellucidæ.

Foliola duplo breviora distantia oblonga (subduplo longiora quam lata) planiuscula, basi vix cordata, apice ad vel ultra $\frac{1}{3}$ bifida, sinu segmentisque anguste triangularibus acutis.

Flores dioici: ♀ ramulo brevissimo constantes, sæpe crebri. Bracteæ sub 5-jugæ, internæ foliis sat longiores suberectæ profunde bilobæ complicatæ, lobis omnibus tenui-acuminatis, anticis lanceolatis subinciso-serratis, lobulis imo longioribus duplo autem angustioribus, segmentisque bracteolæ angustæ ad $\frac{4}{5}$ usque bifidæ complicatæ (basi cum altera bractea connatæ) laciniatis.

Perianthia pallida ovali-fusiformia alte obtuse trigona sensim rostrata, rostello prælongo solo emerso.

30. FRULLANIA ACULEATA, Tayl.

Lond. Journ. Bot. 1846, p. 407 ; G. L. et N. Syn. Hep.

Hab. Andes Quitenses, prope *Cuenca*, pl. ♂ (JAMESON in hb. Hook.) ; in M. *Chimborazo*, alt. 1500^{m}, ad ramulos legit R. SPRUCE pl. ♀ cum perianthiis, m. Aug. 1860. In insulis *Galapagos* legit DARWIN.

F 1·8 × ·7, 1·6 × ·6, *lob* ·2–·25, *c* $\frac{1}{40}$; *f*^{la} ·8 × ·3 ; *br* 2·5–3·0 ; *per* 2·2 × 1·0^{mm}.

Elatiuscula e rubro atra stratificata sæpe pendula. Caules 3–6-pollicares tenues fragiles laxe pinnati subbipinnative intricati.

Folia laxe imbricata late patula siccando sæpius falcato-subsecunda, e basi biauriculato-cordata concavo-amplexante triangularia, in acumen subulato-setaceum flexuosum attenuata ; lobulus sub 8plo brevior tenuis cylindricus cauli appressus basi bifidus ; cellulæ $\frac{1}{40}^{mm}$ longæ, latitudine dimidio minores, rectangulares rhomboideæve, omnes fere æquales, paucissimæ basales subrotundæ.

Foliola plus duplo minora dissita lineari-oblonga ad $\frac{1}{2}$ bifida, segmentis subulato-setaceis, basi perpaulo latiora subcordato - amplexantia, cæterum subplana.

Flores dioici : ♀ in ramo primario valde abbreviato terminales. Bracteæ confertæ subappressæ, intimæ majusculæ liberæ bracteolaque bipartitæ, laciniis omnibus subæquimagnis longe setaceo-acuminatis integerrimis vel supra basin posticam unidentatis.

Perianthia immersa triquetro-fusiformia æquilatera longissime rostrata demum apice trifida.

"Androecia lateralia sessilia oblongo-rotunda" (Tayl. l.c.).

Planta omnium Frullaniarum quam maxime singularis ! aspectu *Hypnum elodes* potius quam ullam hepaticam referens.

SUBGENUS V.—*THYOPSIELLA*, S.

Elata stratificata, procumbens, erecta vel sæpe pendula, pinnata 2–3-pinnatave, eleganter thyoidea, rufa pallidave, raro virescens nigrescensve, caule determinato nec indefinite prolongato.

Folia imbricata patula, in sicco persæpe convolutiva, concava in plerisque, margine toto incurvulo, in paucis planiora margine (saltem postico) recurvulo, semicordato-ovata-oblongave sæpe abrupte apiculata, raro acuminata vel mutica, pro more integerrima ; lobulus cylindraceus cauli subcontiguus et fere semper parallelus—raro parum divergens —sæpe evolutus ; cellulæ plerumque parvæ, pariete incrassato.

Foliola in plerisque dimidium folium subexcedentia, ovali-rotunda (e margine toto recurvo ad speciem spatulata) breviter bifida, apicibus sæpius acutis, basi decurrente sæpissime utrinque auriculata crispataque ; in paucis cladocarpicis majora oblata planioraque, interdum subintegra.

Flores omnium dioici : ♀ utplurimum in caule vel in ramo longiusculo terminales, in paucis ramulo brevissimo constantes (quasi-laterales). Bracteæ 3–5-jugæ bilobæ (complicatæ vel solum concavæ) pro more acuminatæ, lobulis bracteolisque sæpissime spinulosis laciniatisve.

Perianthia plerumque emersa elongata rostellata, vel 3-carinata vel (in paucis) ecarinata cylindrica, in paucissimis pluricarinata, lævia. Calyptra infra medium 4–6 cell. (rarissime solum 2 cell.) crassa. Capsula globosa.

Androecia ramigena, ramulo brevi compresso-globoso vel oblongo constantia ; bracteæ 3–6-jugæ arcte equitantes subæquilobæ diandræ.

Hab. Subgenus revera sylvestre, hominum vestigia pro more effugiens, nullis terris exul, in tropicis montanis sylvestribus valde frequens, in temperatis in planitie quoque degens, arboricolum et saxicolum.

Distr. Ipse in America æquatoriali 13 vel 14 species, omnes in devexis Andium sylvaticis inter 330 et 4000^{m}, nullam in planitie Amazonica, legi ; earum una (*Fr. Brasiliensis*), valde varians, per Americam tropicam in montibus ubique inventa est, aliæ paucæ jam ante in Nova Granata, Mexico, etc., a Lindigio, Liebmanno aliisque lectæ fuerunt ; pleræque tamen novæ videntur. Cæteræ plurimæ species ab auctoribus jam ante descriptæ in terris tropicis et subtropicis Americæ præcipue crescunt, aliæ autem in Asia et Africa necnon in insulis Oceanicis indigenæ sunt. In Europa species 3 v. 4 habemus, quarum una, *Fr. Tamarisci*, in tota zona temperata boreali dispersa est.

Of all the subgenera of *Frullania* this is the most widely distributed and the richest in species, of which all have the same somewhat rigid feather-like habit, and convex shining foliage as the common *Fr. Tamarisci* of our trees and rocks, recalling a branch of Arborvitæ. They grow in dense depressed patches, usually of a reddish hue—rarely pallid or blackish—scarcely ever greenish. The plants are rarely shortened to an inch, and sometimes reach 6 or 8 inches in length, and they are regularly and closely bipinnate—rarely simply or triply pinnate. The leaves are mostly semicordato-ovate, more or less concave, especially at the apex, which is usually abruptly apiculate—rarely acuminate or muticous, very rarely serrulate. The small lobule is almost contiguous to the stem throughout its length ; normally it is a slender conico-cylindrical sac, but very often it is evolute and lanceolato-subulate. A minute process (" stylus ") is sometimes interposed between the lobule and the stem, but is oftener obsolete. Leaf-cells small, often subelongate (rhomboidal), with thickened walls, distinctly sinuate within. The underleaves are always longer than half the leaf, broadly oval—very rarely wider and reniform or orbicular, shortly bifid, with the margin in most species strongly recurved all round, often narrowly cordate—or rather sinuato-biauriculate —at the base, the auricles sometimes projecting laterally (subhastate) ; in one species (*Fr. bicornistipula*) they are nearly as large as the leaves, reniform, nearly entire, but with a slender horn-like process at each angle of the widely retuse apex. The inflorescence in all is dioicous ; the ♀ flowers terminal on primary or secondary branches, in a few species quasi-lateral (cladogenous). Bracts in 3 to 5 rows, mostly free, larger than the leaves, acuminate and often dentate or laciniate, especially as to the lobules and bracteoles. Perianth elongate, normally trigonous —unicarinate beneath ; but in a few species it becomes inflated and cylindrical, losing all trace of keels, and at the apex is abruptly narrowed into a long tubular beak. In two S. Brazilian species, the trigonous perianth becomes pluricarinate, by the addition of intermediate keels of slighter elevation.

The *Thyopsillæ* are all truly *wild* plants, and as a rule avoid the

proximity of man. Yet they are not so often found buried in the depths of the forest as bordering mountain-streams, where they form a broad horizontal fringe on each side of the twigs of bushes and trees, or creep over and hang in tufts from branches and rocks. On bushy, stony hill-sides in the Andes, and on old lava streams scantily clad with a shrubby vegetation, where they are alternately exposed to a burning sun, and cooled and moistened by clouds that are rarely absent from the mountain-side for many hours together, as well as by the frequent heavy rains, is where they seem to most luxuriate. From the Amazonian plain they are apparently quite absent—unless a few exist near the seaboard, as they do farther north in the Guianas, and to southward in Brazil; but from the mouth of the Amazon to the base of the Andes I did not meet a single species. In ascending the Andes the cladocarpous species are the first to appear, at about 400 metres, and they ascend no higher than 1600 metres. They are fine large-leaved plants, and at first sight look more like Madothecas than Frullanias. Low bushes of a *Pilea*, on the western declivity of the conical hill of Lamas, in the Peruvian Andes, are almost completely overrun with *Fr. madothecoides* S. and a large *Lejeunea* (*L. devoluta* S.); *Fr. bicornistipula* grows both on the eastern side of the equatorial Andes (cataract of Agoyan, 1600^{m}) and in the red-bark woods of Chimborazo, at 1200^{m}, on the western side.

The acrocarpous species begin to appear on the slopes of the Andes at about the height where the cladocarpous species disappear, and probably extend upwards to the limit of arborescent vegetation, although I do not seem to have gathered any above 3500 metres. *Fr. Brasiliensis* (including its subspecies *Fr. cylindrica*, and several varieties) is as widely and commonly distributed in the mountainous parts of tropical S. America as *Fr. Tamarisci* in Europe, and is still more variable, but always preserves its perfectly smooth cylindrical perianth. Absent from the great plains of the Amazon and Orinoco, it abounds in the middle wooded region of the Andes, on both sides of the chain, and all through the mountains of South Brazil, as well as in the West Indies and Mexico. Along with it, in the Peruvian and Quitenian Andes, grows *Fr. strobilantha* S.—a beautiful species, with acuminate leaves, and involucres that simulate fir cones, from the large turgid, chaffy, closely-packed bracts with recurved points.

I gathered some fourteen species of *Thyopsiella* in the Andes, but the total number of known species in the world reaches perhaps thrice that number. *Fr. Tamarisci* occurs throughout the north temperate zone, but scarcely overpasses its limits. Abundant in Europe, it is much rarer in America, where it is partially replaced by an allied species, *Fr. Asagrayana*. We have besides it in Europe two or three other species; N. America and the Atlantic islands furnish a few more; but the great bulk of the species are tropical, especially S. American and Malayan. A few Cape species have been identified with Indian, but it is doubtful if any Asian and American species be really identical; and the Australasian species seem all peculiar.

I. CLADOCARPICÆ.—*Flores* ♀ *quasi laterales, ramulo brevissimo constantes.* —Forsan melius cum subgenere antecedente (*Mcteoriopsi*) conjungendæ, distant autem species caule determinato, nec indefinite prolongato, et foliolis magnis latis.

31. *Fr. bicornistipula.*—Elata subtripinnata. F. magna semi-cordato-

oblonga abrupte cuspidata apice subdentata, lobulo minutissimo sæpe basi subcalcarato. Foliola maxima reniformia subintegra apice late retuso ex utroque sinus angulo cilium corniforme proferentia. Br. subæquilobæ basi ciliatæ, lobis lanceolatis acuminatis idem ac bracteolæ bifidæ segmentis inciso-dentatis. Per. immersa fusiformia tricarinata.

32. *Fr. formosa.*—Tripinnata. F. arcte imbricata oblique semicordato-oblonga subapiculata, lobulo minuto digitiformi, vel sæpe evoluto, c. mediis parvis. Foliola sat magna oblato-orbiculata basi subcordata, apice ad $\frac{1}{3}$ bifida, segmentis subapiculatis. Br. bracteolaque bifidæ ciliato-laciniatæ, laciniis crispis interdum iterum lacinulatis.

33. *Fr. madothecoides.*—Elata bipinnata. F. semicordato-ovata subapiculata raro mutica, lobulo semper evoluto, c. mediis mediocribus. Foliola foliis $\frac{1}{2}$ breviora oblongo-orbiculata subdecurrentia apice fere ad $\frac{1}{2}$ bifida, segmentis acuminulatis, margine utrinque 1-vel paucidentata. Br. spinulosæ, bracteola ciliato-laciniata.

II. ACROCARPICÆ.—*Flores* ♀ *in ramo longiore, sæpe iterum ramoso, terminales.*

A. *Folia margine postico recurvo, antico incurvo.*

a. *Perianthia apice saltem trigona.*

34. *Fr. strobilantha.*—Elata bi-tripinnata. F. cordato-ovata subacuminata apiculatave, sæpe apicem versus serrulata, lobulo parvo, caulino semper evoluto. Foliola $\frac{1}{2}$ breviora ovato-oblonga cordato-amplexicaulia, apice ultra $\frac{1}{3}$ bifida, laciniis acuminatis acutis recurvis. Br. 3-jugæ magnæ ventricoso-concavæ paleaceæ subæquilobæ, lobis acuminatis interdum apice serrulatis; bracteola magna orbiculato-ovata, basi turgida, apice breviter bifida, laciniis angustis persæpe integerrimis. Per. vix emersa ovali-fusiformia, supra medium trigona, demum profunde 5-fida, laciniis apice cohærentibus.

35. *Fr. Beyrichiana.*—Bipinnata. F. cordato-ovata apiculata, lobulo majusculo sæpius evoluto. Foliola late oblonga ad $\frac{1}{3}$ fere bifida, segmentis acutis, basi utrinque auricula crispa aucta. Br. 3-jugæ foliis paulo majores profunde complicato-bilobæ, ad sinum 3-laciniatæ, lobis omnibus tenui-acuminatis; bracteola oblongo-lanceolata carinata ultra $\frac{1}{2}$ bifida, segmentis sublaciniatis.

b. *Perianthia cylindrica, omnino ecarinata.*

36. *Fr. tubiflora.*—Humilior arcte bipinnata. F. fere divergentia oblique ovato-lanceolata brevi-acuminata, apice sæpe subdenticulata, lobulo parvo raro evoluto. Foliola oblonga basi breviter biauriculata, apice ad $\frac{1}{3}$ bifida, segmentis acutis. Br. 5-jugæ laxe decurvo-secundæ, intimæ magnæ concavæ vix ad $\frac{1}{2}$ bifidæ, subintegerrimæ, lobis bracteolæque segmentis pungenti-acuminatis. Per. prælonga apice demum 5-fida.

B. *Folia toto margine plus minus incurvo, exindeque concava.*

a. *Perianthia normaliter cylindrica ecarinata.*

37. *Fr. Brasiliensis.*—Elata subbipinnata. F. semicordato-oblonga, ovatove-oblonga, rotundata apiculata, rarissime mutica, lobulo

4plo breviore. Foliola haud duplo breviora late oblonga breviter bifida, segmentis apiculatis, basi utrinque sinuato-auriculata, margine toto valide recurvo. Br. foliis ½ longiores subæquilobæ, lobis subacuminulatis, posticis idem ac bracteolæ segmentis subspinulosis laciniatisve. Per. alte emersa longirostria demum plurifida.

b. *Perianthia trigona.*

38. *Fr. closterantha.*—Gracilis bipinnata. F. subimbricata divergentia semicordato-ovalia abrupte apiculata, lobulo cauli contiguo vel sæpissime evoluto. Foliola majuscula obovato-oblonga breviter bifida, segmentis acutis, basi anguste biauriculata. Br. iis *Br. Brasiliensis* subconformes. Per. alte emersa tenui-fusiformia valde obtuse trigona rostellata ore demum 4–6-fida.—Var. *Canelensis.* Elata tenuis tripinnata. F. vix imbricata oblongo-rotunda apiculata, lobulo 3plo breviore fere semper evoluto. Foliola fere duplo breviora late oblonga ad ⅓ bifida, segmentis acutis, basi sinuato-biauriculata. Br. foliis longiores, lobis acuminatis, lobulis duplo minoribus bracteolæque segmentis angustis laciniato-ciliatis.

39. *Fr. rigescens.*—Elata robusta inæqualiter 2–3-pinnata. F. arcte imbricata semicordato-oblongo-rotunda obtusata cum apiculo minuto, auricula antica magna crispa, lobulo minuto sæpius evoluto. Foliola majuscula orbiculata, basi parvi-biauriculata, apice ad ⅓ bifida, segmentis subapiculatis. Br. confertissimæ, lobis longe apiculatis spinulosis, lobulis bracteolæque magnæ segmentis longissime flexuoso-laciniatis. Per. alte emersa fusiformia, supra medium obtuse 3–4-gona, sensim rostellata.—Var. *mollicula*, magis regulariter pinnata, foliis paulo angustioribus, foliolis conformibus, bracteis autem pro more integerrimis, bracteola raro lacinia una alterave aucta; perianthiis longe tenuioribus triplo longioribus quam latis.

40. *Fr. clandestina.*—Elata valida 2–3-pinnata. F. subimbricata semicordato-orbiculata minute apiculata valde concava, lobulo fere 4plo breviore nunquam evoluto. Foliola magna cordato-orbiculata basi subcrispula, apice emarginata, sinu lato triangulari, segmentis prælatis acutis.

41. *Fr. Sabanetica.*—Elongata pendula laxe bipinnata. F. subimbricata semicordato-ovato-oblonga subacuta tenui-apiculatave, margine supero involuto, lobulo tenui interdum evoluto. Foliola haud duplo breviora subrectangulari-oblonga ad ¼ bifida, margine basi recurvo. Br. maximæ foliis fere triplo longiores subintegerrimæ, lobulis bracteolæque profunde bifidæ segmentis tenuissime acuminatis. Per. emersa nigricantia fusiformia trigona, carinis lateralibus devexis.

42. *Fr. flexicaulis.*—Elata pendula valde flexuosa inæqualiter pinnata. F. subimbricata late cordato-ovata apice valde decurvo rotundata, mutica, lobulo tenui cylindrico-companulato. Foliola ovato-oblonga angulato-repanda, ad ⅓ bifida, segmentis acutis, basi obtuse subhastata. Br. lobis ovatis obtusatis subintegerrimis, lobulis bracteolæque segmentis longe acuminatis crispato-laciniatis. Per. alte emersa nigricantia obovato-oblonga triquetra subtruncata longirostria.

43. *Fr. hæmatocysta.*—Nigro-sanguinea subpinnata. F. late imbricata late cordato-ovata brevi-acuta subapiculata concava, lobulo majusculo crasse cylindrico paulo divergente. Foliola orbiculata subdecurrentia emarginata, dentibus acutis, margine infero valide recurvo.

31. FRULLANIA BICORNISTIPULA, Spruce. (TAB. II.)

Hab. Andes Quitenses, ad pedem montis *Tunguragua* juxta fl. *Blanco* ostia et in montis *Chimborazo* devexis occidentalibus, alt. 1500^{m}, in arborum ramulis.

F 2·3×1·3, 2·0×1·1, *lob* ·15–·2, *c* $\frac{1}{4\,0}$; f^{la} 1·5×2·0, 1·4×1·8; *br* 2·5; br^{la} 2·25×1·0; *per* 2.0×·75^{mm}.

Elata pendula olivaceo-virens rufulave. Caules 3–6-pollicares imbricati bi–tripinnati, ramis dissitiusculis.

Folia imbricata divergentia subplana oblique semicordato-oblonga vel subovata abrupte cuspidata, apicem versus paucidentata, angulata, vel integerrima, basi antica caulem longe transeuntia, postica sinuato-lobulata, margine toto lenissime recurvula; lobulus præminutus folio 12–15plo brevior, cauli subcontiguus parallelusque, basi in calcar breve sæpe productus; cellulæ parvulæ subelongatæ opacæ, pariete incrassato intus 6-sinuato, subæquimagnæ, infimæ solæ cæteris multo majores discoloresque.

Foliola imbricata maxima, latiora quam longa, reniformi-orbiculata, rotundatá, retusula vel late subemarginata, ex utroque sinus angulo cilium corniforme $\frac{1}{8}$^{mm}. longum, cellulis 7–8 uniseriatis conflatum, rectum v. curvatum, proferentia, fere planissima, solum juxta basin canaliculatam amplexantem margine recurvula.

Flores dioici: ♀ crebri, ad ramos primarios, raro ad secundarios, nunquam ad ipsum caulem, ramulo abbreviato constantes, quasi-laterales. Bractæ 5–6-jugæ, suberectæ confertæ, intimæ foliis paulo longiores brevissime connatæ ad $\frac{2}{3}$ bilobæ, lobis lanceolatis acuminatis æquilongis, postico angustiore, ipsa basi ciliis paucis longis ornatæ, dein brevi spatio integræ, ad lobos profunde inciso-dentatæ; bracteola longe cuneato-oblonga ultra $\frac{1}{2}$ bifida, eodem modo ac bracteæ inciso-dentata basique ciliata; br. inferiores sensim minores liberæ minus dentatæ, lobulo tamen evoluto, infima minuta sola nonnunquam saccifera vel etiam ad solum sacculum redacta. Pistillidia 2.

Perianthia immersa, inferne rufa apice pallida, fusiformia tricarinata sensim rostellata brevia, demum trifida. Calyptra subglobosa tenuis, dimidio inferiore 2 cell. crassa. Capsula globosa, stratis cellularum duobus conflata. Elateres a medio valvularum ad apicem usque sparsi, persistentes elongati utrinque truncati late unispiri, plerumque nudi, folliculo dissoluto. Sporæ maximæ, elaterum diametro 4plo latiores, flavæ angulatæ pulchre rufo-tuberculatæ, tuberculis humilibus crebris æquidistantibus.

32. FRULLANIA FORMOSA, Spruce.

Hab. Ad pedem Andium Quitensium orientalem, secus fluvium *Bombonasa*, in arborum ramulis.

F 1·0×0·7, *lob* ·15, *c* $\frac{1}{5\,0}$; f^{la} ·6×·7; *br* 1·6^{mm}.

Elata rufo-badia horizontaliter patula. Caules 3–pollicares tripinnati, frondem triangulari-plumæformem sistentes.

Folia arcte imbricata, subplana, apice decurvula, valde oblique oblonga abrupte acuta interdum minute apiculata, basi antica profunde semicordata (auricula subrotunda); lobulus minutus conico-cylindricus cauli proximus et subparallelus, sæpe evolutus lanceo-

latus canaliculatus, cellulæ parvæ, plures inferiores majores discoloresque. Folia ramea ramulinaque longius apiculata, lobulo semper perfecte voluto.

Foliola imbricata foliis æquilata, breviora tamen, oblato-orbiculata, ad $\frac{1}{3}$ bifida, rima angusta, segmentis subapiculatis planiusculis, basi subcordata amplexicaulia margineque ibidem tam recurvo ut spathulata videantur.

Flores dioici : ♀ quasi-laterales secus caulis ramorumque primariorum apicem oriundi, crebri, assurgenti-secundi. Bracteæ 5-jugæ confertæ recurvo-patulæ complicatæ subæquilobæ, intimæ foliis $\frac{1}{2}$ longiores acuminulatæ, bracteolaque bifida toto fere margine pulchre ciliato-laciniatæ, laciniis flexuosis aliis iterum lacinulatis ; bracteæ exteriores sensim minores pariter laciniatæ.

Perianthia (valde juvenilia) trigono-prismatica rostellata.

Pulcherrima species, *Fr. ulotrichæ* Tayl. et *Fr. Deppii* G. subsimilis, nulli autem arcte affinis. Habitu *Fr. replicatam*, Nees. magis refert, differt præcipue lobulis erectis nec reflexis.

33 FRULLANIA MADOTHECOIDES, Spruce.

Hab. Andes Peruvianos, in monte *Lamas*, alt. 750^{m}, ad fruticum ramulos.

F 1·8 × 1·2, 1·65 × 1·1, *lob* ·6, *c* $\frac{1}{40}$—$\frac{1}{32}$; f^{la} 1·1 × ·85^{mm}.

Caules 3–5-pollicares, horizontales pendulive stratificati, bipinati, aliis ramis elongatis, aliis brevissimis fœmineis.

Folia pallida flavo-virescentia vel etiam albida, solum ramorum apicem versus subrufa, imbricata, subdivergentia, planiuscula, medio parum concava, margine postico toto recurvulo, semicordato-ovata subabrupte acuta obtusulave, plerumque brevi-apiculata raromutica, auricula antica oblonga subcircinata ; lobulus cauli contiguus semper evolutus folio triplo brevior subulatus canaliculatus ; cellulæ medii folii parvulæ subelongatæ pellucidæ, basin versus sensim majores intus sinuatæ, secus marginem minores subæquilateræ.

Foliola $\frac{1}{2}$ minora imbricata oblongo-orbiculata vel subquadrata vix ad medium usque acute bifida, medio margine utrinque grandiuscule 1–2-dentata, segmentis apicis planis acuminulatis integerrimis vel externe angulato-dentatis, basin versus profunde canaliculata marginibus recurvis, basi ipsi utrinque subsinuata parum decurrentia.

Flores dioici : ♀ crebri in ramulis abbreviatis ad caulem præcipue, rarius ad ramos primarios, terminales. Bracteæ 3–5-jugæ, interiores increscentes recurvo-patulæ bipartitæ, lobo ovato sensim acuminato margine interno basin versus paucilaciniato, raro toto fere spinuloso ; lobulo paulo minore ovato-lanceolato spinuloso bracteola oblonga ad $\frac{1}{2}$ bifida, laciniato-ciliata. Pistillidia 4-longius-cula intra perianthium valde juvenile lageniforme semirecepta.

Obs. Stirps pulcherrima, inter *Thyopsiellam* et *Meteoriopsin* fere media. *Fr. Griffithsiana* Tayl. (e Brasilia australi) quoad flores ♀ cladogenos etc. affinis, folia habet multo minora valde concava, margine toto (basi excepta) recurvulo ; folia suborbiculata basi hastato-cordata, segmentis apicis alisque valide recurvis. Quum nostratis perianthia nondum cognita sunt, anne eodem modo plurisulca dubium remanet.

34. FRULLANIA STROBILANTHA, Spruce.

Hab. Andes Quitenses, ad fruticum ramulos secus fluvium *Pastasa*, infra *Baños*, alt. circiter 1500^{m}; Andes Peruvianos, ad arbores et rupes montis *Campana*, alt. 1200–1500^{m}.

F 1·5 × ·8, *lob* ·15–·5, $c\frac{1}{5\,0}$; f^{la} 1·0 × ·75; *br* 3·2 *longæ*; *per* 3·5 × 1·5^{mm}.

Caules 2–4-pollicares in cespitem densum sæpe suberectum stratificati, bi-tri-pinnati, sæpe plumæformes, ramis subdivergenti-decurvulis.

Folia e pallide viridi rufo-badia, interdum albescentia, fere horizontalia, in sicco cauli plus minus circumvoluta, e basi cordata ovata subacuminata acutissima sæpeque tenui-apiculata, integerrima v. apicem versus serrulata, margine infero toto recurvo, supero anguste incurvo; lobulus parvus cauli approximatus et subparallelus, fol. caulinorum semper evolutus lanceolato-subulatus canaliculatus, ramulorum saccatus breviter conico-campanulatus v. subcylindricus ore bifidus; cellulæ parvæ subelongatæ, inferiores mediæ longiores discoloresque.

Foliola foliis dimidio breviora subimbricata ovato-oblonga, basi lata cordato-amplexicaulia, apice ultra $\frac{1}{3}$ acute bifida, laciniis acuminatis acutis recurvo-hamatis, alis recurvis, toto medio carinato-canaliculata.

Flores dioici: ♀ in ramo brevi longioreve terminales, sæpe cum innovatione. Bracteæ 3-jugæ rufo-flavidæ paleaceæ basi ventricoso-concavæ arcte imbricatæ, apice squarroso-recurvæ, intimæ folia plusquam duplo excedentes, liberæ, subæqualiter bilobæ, lobis breviuscule tenui-acuminatis integerrimis vel ad acumen serrulatis, interdum supra bracteæ basin posticam lacinula auctæ; bracteola magna orbiculato-ovata acuminata, basi turgida, apice breviter bifida, laciniis tenui-subulatis serrulatis vel persæpe integerrimis.

Perianthia ovali-fusiformia inferne teretia supra medium obtuse trigona acuminata sensim longirostria (rostello solo sæpe emergente), demum ab apice profunde 5-fida, laciniis lanceolato-subulatis apice sæpe cohærentibus.

Androecia in planta tenuiore creberrima, oblongo-globosa, folio axillari longiora; bracteæ 4–7-jugæ iis *Fr. Brasiliensis* simillimæ.

Obs. I at first thought that this might be the true *Fr. macrocephala* L. et L. in Lehm. nov. et minus cogn. stirp. V., p. 20, but the description in 'Syn. Hep.' p. 460 makes no mention of the large turgid chaffy bracts, imbricated so as to resemble a fir-cone; nor of the fusiform perianth, tapering gradually into a trigonous beak, whose point barely peeps out from the involucre; nor of the acuminate segments of the underleaves, which in the Synopsis are described simply as "ovalia, bifida, laciniis revolutis."

35. FRULLANIA BEYRICHII, L. et Lindenb.

Syn. Hep. 460.

Hab. Andes Peruvianos, in M. *Guayrapurina*, alt. 900^{m}, supra folia emortua filicesque: pl. ♀ sola, sterilis. Brasilia (BEYRICH). Peruvia (POEPPIG). *Silla de Caracas* (MORITZ).

F 1·1 × ·75, *lob* ·45, *c* $\frac{1}{4\,0}$; f^{la} ·8 × ·55; *br* 1·5; br^{la} 1·2 × ·6^{mm}.

Prostrata rufescens. Caules 3-pollicares nigrescentes, bipinnati, ramis late patulis (angulo axillari sub 80°), frondem lanceolatam sistentes.

Folia imbricata patenti-decurvula, cordato-ovata ex subacuto apice apiculata, basi valde inæqualia antice longius supra caulem descendentia et transeuntia, margine repandulo postico recurvulo; lobulus fere triplo brevior, raro saccatus ovali-cylindricus, plerumque evolutus lanceolato-subulatus; cellulæ parvulæ elongatæ flexuosæ subpellucidæ, pariete incrassato.

Foliola vix $\frac{1}{2}$ breviora late oblonga fere ad $\frac{1}{3}$ bifida, sinu segmentisque acutis, basi utrinque in auriculam sinuato-crispam oblongam producta, margine toto anguste recurvo.

Flores dioici: ♀ in ramo primario terminales, semper fere innovatione ramosa suffulti. Bracteæ confertæ suberectæ foliis longiores complicatæ ad $\frac{4}{5}$ alt. bilobæ; lobi antici lanceolati tenui-acuminati angulati fere integerrimi; lobuli parum minores caudato-acuminati basi laciniis 3 aucti; bracteola libera (bracteis inclusa imbricataque) oblongo-lanceolata complicato-carinata ultra medium bifida segmentis angustis sublaciniatis spinosisve.

Fr. tubiflora S. folia habet magis acuminata, bracteas (in ramo ♀ incrassato) dissitas homotropas haud caudato-acuminatas.

Obs. The leaf subtending a branch is obliquely cordate—the antical auricle being slightly larger than the postical—and the lobule is represented by two narrow lanceolate leaflets, whereof the outer is connate at the very base with the lobe and also with the inner and smaller leaflet: both are *internal* to the large lobe, or leaf proper.

36. FRULLANIA TUBIFLORA, Spruce.

Hab. Andes Quitenses, in valle fluvii *Pastasa*, loco *Antombos*, alt. 1500^{m}, ad ramulos, cum *Fr. Brasiliensi* et *strobilantha*.

F ·9×·5, *lob* ·2, *c* $\frac{1}{60}$–$\frac{1}{50}$; f^{la} ·6×·4, ·4×·2; *br* 2·0×1·4; br^{la} 1·9×1·25; *per* 3·5×1.3^{mm}.

Subpusilla, e rufo-purpureo nigrescens. Caules $1\frac{1}{2}$-pollicares arcte bipinnati, ramis brevibus.

Folia subimbricata fere divergentia oblique ovato-lanceolata, basi anguste semicordata, apice sensim vel subabrupte breviter acuminata ibidemque sæpe angulata vel subdenticulata, margine supero anguste incurvo, infero recurvo; lobulus plus 4plo brevior cauli parallelus et subcontiguus conico-cylindricus, ore obliquo; cellulæ fere minutulæ elongatæ flexuoso-rhomboideæ, pariete valde incrassato, plures inferiores multo majores. Folia ramulina sensim multo minora, eorum lobulo tamen caulinorum æquimagno, apice sæpe distincte serrulata.

Foliola $\frac{1}{2}$ minora subimbricata subappressa, oblonga (ramea angustiora) e margine toto anguste recurvo ad speciem rectangularia, basi breviter biauriculato-cordata vix sinuata, apice ad vel ultra $\frac{1}{3}$ subobtuse bifida, segmentis acutis.

Flores dioici: ♀ in ramo superne incrassato terminales; bracteæ 5-jugæ laxæ decurvo-secundæ (folia *Sendtneræ* haud male simulantes), intimæ foliis duplo longiores ovatæ valde concavæ vix ad $\frac{1}{2}$ bifidæ, segmentis haud longe sed acutissime acuminatis repandulis, postico sat minore inæqualiter bilobo vel medio margine spina aucto; bracteola late ovalis ad medium fere bifida, segmentis tenui-acuminatis integerrimis.

Perianthia alte emersa, foliis fere 4plo longiora, cylindracea lævissima ex apice rotundato rostellata, demum breviter 5-fida.

Fr. macrocephala L. et L. perianthia (ac in nostra) ecarinata-ovata vero, nec cylindrica—habet; foliis longe acuminatis primo visu differt.

37. FRULLANIA BRASILIENSIS, Raddi.

Crypt. Brasil. in Mem. di Modena, t. xix.

Hab. In Andibus Quitensibus et Peruvianis sylvaticis, alt. 1000–2500^{m}, sat frequens, ad arborum et fruticum ramos.

F 1·0 × ·6, *lob* 1·5, *c* $\frac{1}{10}$–$\frac{1}{60}$; *f*^{la} ·65 × ·5; *br* 1·5; *per* 2·75 × ·75^{mm}.

Elata rufescens stratificata, procumbens v. ex p. pendula. Caules 3–6-pollicares bipinnati v. pinnatim decompositi.

Folia subimbricata, angulo fere recto divergentia, subplana v. caviuscula, e basi obliqua semicordata (auricula antica circinata) oblonga, apice rotundato apiculata; lobulus 4plo brevior cauli contiguus cylindricus, sæpe evolutus subulatus canaliculatus; cellulæ subminutæ opacæ, pariete incrassato, subbasales mediæ multo majores discolores v. fere concolores.

Foliola haud 2plo breviora contigua late oblonga basi sinuato-constricta longiuscule auriculato-cordata—vel subsagittata—apice ad $\frac{1}{4}$–$\frac{1}{3}$ alt. bifida, segmentis apiculatis cucullato-recurvis, margine toto anguste valide recurvo.

Flores dioici: ♀ terminales; bracteæ 3–4-jugæ, intimæ f. caulinis dimidio majores suberectæ parum inæquilobæ, acuminulatæ vel solum acutæ apiculatæve, lobis anticis dente uno alterove spinulosis, lobulis cum bracteola plus minus alte connata parce spinuloso-dentatis laciniatisve.

Perianthia bracteas fere duplo superantia, basi rufa apice albido-viridia flavidave, e basi conica cylindracea ecarinata, ex apice turgido rotundato longirostria, demum ore plurifida. Calyptra basin versus 6-cell. crassa, superne sensim tenuior. Capsula globosa exserta. Pedicellus cellulis pluristratis conformibus constans.

Amenta, ♂ ramigena folio axillari longiora compresso-globosa, basi foliis paucis rudimentariis stipata; bracteæ propriæ sub 6-jugæ arctissime equitantes subopppositæ, fere dolabriformes subturgidæ æquilobæ. Antheridia bina majuscula tenuissime pedicellata. Bracteolæ lineares bidentatæ hinc v. sæpe utrinque bracteis connatæ.

Obs. In montibus totius Americæ tropicæ valde abundat. *Fr. Brasiliensis*; in planitiebus mullibi (quantum scio) invenitur. Varietates innumeras cognoscimus; sequentes tres ipse legi.

Var. *cylindrica* (Fr. cylindrica Gotts.) subvar. *Lindigii* Gotts. Hep. N. Granat. 77. Folia ovata ovatove-oblonga, apice valide decurvo subobtuso minute apiculata. Foliola submajora fere orbiculata. Bracteæ sæpe basi liberæ, bracteolaque margine laciniatæ. Perianthia apice demum 3–5-fida. *Hab.* Andes Quit. juxta fl. *Pastasa*, loco *Boca del Rio Verde*. Cum exemplaribus Novo-Granatensibus a Lindigio lectis, in herb. amicissimi Lindbergii asservatis, perfecte congruit.—Forma *heterocalyx* adest perianthiis maturis fructiferisque, aliis ultra bracteas vix emergentibus, apice v. etiam fere a basi obtuse trigonis triplicatisve sensim rostratis, aliis (in eadem stirpe) forma cylindrica elongata normali. Talia perianthia abbreviata pro more in caulis apice corymbose congesta sunt.

Var. *elegantula* S. Tenella eleganter bipinnata, vel magis elongata ramis paucioribus inæquilongis. Folia semicordato-ovata ovatove-oblonga apice parum decurvo acuta obtusave—nunquam apiculata. Foliola basi perobscure biauriculata. Flores ♀ ad ramos ramulosque superiores terminales, creberrimi; bractearum lobuli bifidi sublaciniati—

interdum fere æqualiter 4-fidi; bracteolæ segmenta integerrima vel sublaciniata. Perianthia iis *F. brasiliensis* conformia, apice demum sub 8-fida.—*Hab.* in montibus *Chimborazo et Azuay*.—Pro specie propria fere habenda.

Var. ? *robusta* S. Elata rufo-badia-nigrescensve. Folia submajora apice fere cucullato minutissime apiculata v. sæpe mutica. Bracteæ integerrimæ v. subspinulosæ. Perianthia alte emersa fusiformi-cylindrica apicem latum versus obscure trisulca.—*Hab.* in monte *Tunguragua*.

38. FRULLANIA CLOSTERANTHA, Spruce.

Hab. In fl. *Pastasa* ripis, ad fl. *Verde* ostia, alt. 1400^{m}, ramicola.

F ·8 × ·55, *lob* ·35, *c* $\frac{1}{10}$, *f ramea* ·5, *lob* ·15 ; f^{la} ·6 × ·45, ·7 × ·55 ; *br* 1·6 – 2·0 ; *per* 4·0 × 1·0^{mm}.

Plantæ graciles 1½–3-pollicares, facie *Fr. Brasiliensis* var. *elegantulæ*, concinne bipinnatæ et in frondem latam expansæ.

Folia subimbricata planiuscula vel concava divergentia, oblique semi-cordato-oblonga-ovaliave, ex abrupto apice apiculata—ramea apiculo longiore cuspidata ; lobulus fere semper explicatus subulatus, raro (ramulorum) conico-cylindricus erectus folio plus triplo brevior ; cellulæ parvæ, pariete incrassato.

Foliola sat magna (=folii ¾–⅞) obovato-oblonga, basi anguste hastatim-cordata, margine toto valide recurvo, apice ad ¼–⅓ bifida, segmentis recurvis apiculato-acutis.

Flores dioici : ♀ terminales. Bracteæ 3–4-jugæ arcte imbricatæ concavæ, iis *Fr. Brasiliensis* sat similes, intimæ cuspidato-acuminatæ paucispinæ, lobulo inæqualiter bifido ; bracteola cum altera bractea leniter connata—vel sæpe adnata, nempe intra ejus marginem eidem adfixa—ovali-lanceolata, ad ½ fere bifida, subspinosa, segmentis acuminatis.

Perianthia primum subinclusa demum alte emersa, foliis 4–5-plo longiora, tenui-fusiformia, haud teretia sed valde obtuse trigona, apicem sensim rostratum versus magis distincte trisulca, demum ore 4–8-fida. Calyptra plus duplo brevior, inferne cellulis 4–5-stratis conflata. Pedicellus sat longe exsertus, demum (capsula globosa evacuata) deflexus.

Obs. Anne eadem ac *Fr. triquetra* L. et G. Syn. Hep. 780, in Mexico lecta ; quæ tamen nomini male respondet, quum perianthia haud "triquetra" descripta sunt, sed "ovata apice valde attenuata, dorso ad apicem vel sulcata vel obsolete carinata ventre *obtuse* unicarinata." Eperianthii forma, caule simpliciter pinnato, etc. diversam speciem censerem.—*Fr. Trianæ* G. Hep. Novo-Granat. p. 79—a cl. auctore incomplete descripta—differre videtur foliis breviapiculatis, et bracteis solum apiculatis—nec cuspidato-acuminatis, ac in nostra.—*Fr. Beyrichiana*, foliis margine postico recurvis—nec toto ambitu incurvis, facile distincta.

Var. *hylonoma* S.—F 1·0 × ·7, lob ·3 ; f^{la} ·65 × ·55, ·4 × ·32 ; br 1·3 × ·45 ; br^{la} 1·2 × ·6^{mm}.—Elatior pendula 3–6-pollicaris tripinnata. Folia majora, brevius apiculata, lobulo pro ratione minore semper fere evoluto. Foliola foliis duplo fere breviora oblonga basi sinuato-biauriculata. Bracteæ minores quam in typo, lobulis idem ac bracteolæ segmentis laciniato-ciliatis.—In monte *Abitagua* sylvæ *Canelos*, ad arbores, sterilis.

39. FRULLANIA RIGESCENS, Spruce.

Hab. In monte *Lamas* Andium Peruviæ, alt. 750^{m}, inter fruticulos ad terram saxosam.

F 1·2 × 1·0, *lob* ·2, *c* $\frac{1}{50}$–$\frac{1}{30}$; f^{la} ·75 × ·8; *br* 1·8–2·0; *per* 3·0 × 1·0^{mm}.

Elata badia purpurascensve rigidula dense suberecte cæspitosa. Caules 3–4-pollicares, 2–3-pinnati, ramis ramulisque valde inæquilongis, his sæpe decurvo-squarrosis.

Folia confertim imbricata semicordato-oblongo-rotunda apice decurvo obtusata minutissime apiculata, auricula antica magna margine crispa; lobulus posticus minutus (lobo 6plo brevior) semper fere evolutus subulatus, rarissime secus ramulorum apicem saccatus conico-cylindricus; cellulæ parvæ, plurimæ basin versus majores discolores ($\frac{1}{30}$^{mm}, flavidæ).

Foliola majuscula imbricata orbiculata, basi abrupte angustata deorsum in auriculas duas parvas producta, apice ad $\frac{1}{3}$ usque acute bifida, segmentis late ovatis acutis subapiculatisve, margine subrecurvo.

Flores dioici: ♀ terminales in ramo sæpe brevi. Bracteæ 5-jugæ confertissimæ appressæ, intimæ foliis sub-majores concavæ subconnatæ vel liberæ, lobis ovatis acutis longe apiculatis spinulosis, lobulis (sæpe bifidis) ut et segmentis bracteolæ magnæ ovatæ bifidæ acuminulatis laciniatis, laciniis longissimis flexuosis. Bracteolæ exteriores bifidæ dein profundissime laciniatæ vel potius pinnatifidæ.

Perianthia alte emersa fusiformia, a basi ultra medium subteretia, superne obtuse 3–4-gona, vel melius 3–4-plicata, sensim in rostellum attenuata (*i.e.* apice subulata), demum 4-fida.

Ramus ♀ interdum elongatus, innovando 2–4-florus.

Var. *mollicula.* Tenuior, mollior, magis æqualiter bipinnata. Folia laxiora sublongiora. Bracteæ pro more integerrimæ; bracteola raro lacinia una alterave armata.—In monte *Campana*, *Lamas* parum distante.

40. FRULLANIA CLANDESTINA (M. et N.).

Lejeunea clandestina M. et N. Ann. Sc. Nat. (1836); *Frullania cl.* G. L. et N. Syn. Hep. 457.

Hab. Rio Verde (*Pastasa*) ad frutices, cum *F. Brasiliensi.* Planta ♂ sola.

F ·9 × ·9, *c* $\frac{1}{50}$; f^{la} ·75 × ·8; *lob* f. ·25^{mm}.

Elata valida e pallido rufescens, 4–5-pollicaris, bi- et sub tri-pinnata.

Folia subimbricata oblique semicordato-orbiculata vel-subovato-orbiculata (tam lata quam longa) concava, margine toto incurvulo, apice subcucullata minuteque tenui-apiculata; lobulus fere 4plo brevior cauli contiguus parallelus, semper saccatus ovalis; cellulæ parvæ rhomboideo-oblongæ toto ambitu *valde incrassatæ*, intus 6-sinuatæ, fere vacuæ, basin versus paulo majores discoloresque. Lobulus *nunquam* evolutus, tectus.—Folia ramea longius apiculata, lobulo pro ratione majore ovali-conico; omnia siccando convolutiva.

Foliola perpaulo minora oblato-orbiculata, basi lata cordata subcrispula non autem sinuata, apice *brevi-emarginata*, sinu late triangulari obtuso, segmentis prælatis apiculato-acutis sed e margine toto recurvulo mutica videantur, a basi ad apicem usque late unisulca.

Amenta ♂ ramulo brevi (ad ramos primarios secundariosve) constantia, folio axillari sublongiora; bracteæ 3–5-jugæ arcte equitantes naviculares subæqualiter bilobæ, lobis late semilunatis acuminulato-acutis.

Cum descr. *F. clandestinæ* Syn. Hep. congruit quoad folia, foliola magna brevissime emarginata, etc.; in illa tamen lobulus interdum evolutus invenitur, quod in nostra nunquam vidi.

Quum tamen omnes *Frullaniæ* eodem modo plus minus variabiles, vix pro distinctione habendum est.

41. FRULLANIA SABANETICA, Gottsche.

Hepat. Novo-Granat. p. 76.

Hab. In monte *Guayrapata* Andium Quitensium, ad ramulos. In Andibus Granatensibus ad *Sabaneta* a cl. LINDIG antea inventa.

F 1·2 × ·75, *lob* ·3, *c* $\frac{1}{60}$—$\frac{1}{48}$; f^{la} ·75 × ·5; *br* 3·0; *per* 3·8^{mm}.

Cæspitoso-pendula e viridi rufo-atra; caules 3–6-pollicares laxe bipinnati.

Folia subimbricata ovato-oblonga, basi semicordata, ex subacuto decurvo apice tenui-apiculata, margine supero anguste involuto; lobulus 4plo brevior tenuis cauli subcontiguus fereque parallelus clavato-cylindricus, interdum evolutus lanceolatus acuminatus; cellulæ parvæ opacæ subelongatæ intus conspicue 6-sinuatæ, inferiores sensim majores.

Foliola subdimidio minora subimbricata rectangulari-oblonga—e media basi canaliculata alisque ibidem recurvis subcuneata videntur—apice triangulari ad $\frac{1}{4}$ acute bifida, laciniarum margine anguste revoluto.

Flores dioici: ♀ terminales. Bracteæ sub 4-jugæ distiche subrecurvo-patulæ, intimæ foliis fere triplo longiores liberæ, lobis anticis tenui-acuminulatis, lobulis ut et bracteolæ profunde bifidæ segmentis lobis æquilongis tenuissime acuminatis, e margine revoluto canaliculatis, integerrimis vel basin versus unidentatis.

Perianthia magna emersa e rufo nigrescentia fusiformi-prismatica trigona compressa, facie antica convexa medio sulcata, angulis lateralibus devexis. Perianthium juvenile basi viride, apice ruberrimum, maturum tamen totum nigrescens. Calyptra pyriformis, dimidio infero subcylindrica 6 cellulas crassa, ibidem papillis paucis intus aucta (ad *Kantiæ Trichomanis* fere instar), apice demum bi-raro trivalvis. Pedicellus perianthio subduplo longior. Capsula ad $\frac{3}{4}$ semicircumferentiæ usque fissa; valvulæ facie interna papillis inæquilongis conspersæ.

Cum descriptione cel. Gottschei, l. c. et præcipue cum dimensionibus datis bene congruit; solum quoad foliola plantæ Lindigianæ "ovato-rotunda" paulo differat.

42. FRULLANIA FLEXICAULIS, Spruce.

Hab. In Andibus Quitensibus loco non citato (JAMESON), in monte *Mulmúl*, alt. 3000^{m}, supra frutices vetustos, ipse legi.

F 1·1 × 1·0, 1·2 × 1·15, *lob* ·35—·4 × ·15, *c* $\frac{1}{55}$—$\frac{1}{50}$; f^{la} ·8 × ·65, ·6 × ·4; *br* 1·5–1·7, br^{la} 1·6 × 1·1; *per* 2·5 × 1·15, 2·5 × 2·0^{mm}.

Rufo-nigricans badiave, apice virescens, cæspitoso-pendula. Caules 3–4-

pollicares penduli, flexuosi, inæqualiter pinnati, pinnis brevibus, aliis pinnulatis, floribundi.

Folia dissita v. subimbricata valde decurva—siccando convolutiva, late cordato-ovata rotundata, vel fere orbiculata, mutica, repandula, antice caulem late transeuntia; lobulus cauli contiguus, folio 3plo brevior cylindrico-campanulatus, ore compresso rotundato-bilabiato; cellulæ parvæ pachydermes subpellucidæ, paucæ inferiores majores.

Foliola paulo breviora, dissita, ovato-vel cuneato-oblonga ad $\frac{1}{3}$ bifida, rima angusta, segmentis subacutis, subcarinata, alis recurvis, margine ipso subplano repando, basi decurrenti-amplexantia, sinuato-subhastata.

Flores dioici: ♀ terminales. Bracteæ 4-jugæ, intimæ foliis sat majores, liberæ, lobo ovato rotundato obtusatove concavo integerrimo vel interne unidentato, lobulo angustiore inæqualiter bifido bracteolæque subrhombeæ carinatæ segmentis longe acuminatis profunde laciniatis, laciniis tenuibus flexuosis sæpe iterum lacinulatis.

Perianthia nigrescentia alte emersa, ovali-fusiformia vel subobovata, alte triquetra, ex abrupto subtruncato apice valde longirostria, carinis lateralibus valde devexis.

Fr. paradoxa, L. et L. (Syn. Hep. 463), quoad bractearum lobulum lacero-ciliatum nostræ affinis, differt lobo antico magno apice acute dentato, et fol. caulinorum lobulis crassis.—*Fr. ulotricha*, Tayl., Lond. Journ. 1846, p. 405 (Syn. Hep. 780) differt foliis longioribus, oblongo-ovatis et bractearum lobo acuto.—*Fr. Deppii*, Gottsche, e terris Mexicanis, fronde multo magis dilatata, pinnis tripinnatis, gaudet; lobulo multo altiore (=lobi $\frac{3}{4}$, vel, ubi explanatus invenitur, lobo æquialto), lobulis involucri solum serrato-dentatis.

43. FRULLANIA HÆMATOCYSTA, Spruce.

Hab. Pallatanga Andium Quitensium, alt. 1800^{m}, ad arbores.

F 1·3 × 1·1, *lob* ·6, *c* $\frac{1}{3\cdot5}$; f^{la} ·75 × ·7^{mm}.

Cæspites depressi lati nigro-sanguinei. Caules 2–3-pollicares stratificati pinnati vel subbipinnati, ramis brevibus inæquilongis.

Folia late imbricata suboblique late cordato-ovata triangulari-acuta apiculatave, decurvo-concava; lobulus duplo brevior, crasse cylindricus vel subclavatus, ore obliquo cauli subcontiguus, dein angulo sub 30° divergens; cellulæ mediocres æquilateræ, pariete incrassato, mediæ intus intense coloratæ, ad auriculam anticam minores ecoloratæque.

Foliola contigua dimidio folio longiora orbiculata, basi subdecurrente caulem amplexantia, apice breviter emarginata, dentibus acutis conniventibus, medio canaliculata, margine inferne valde recurvo.

Flores ?

A *Fr. flexicauli*, S., subaffini, differt foliis acutis, lobulo majore et crassiore, et foliolis duplo fere latioribus.

SUBGENUS 6.—*DIASTALOBA*, S.

Sectio (s. subgenus) *Frullaniæ*, habitu proprio pusillo tenello, præcipueque foliis minus profunde fissis (unde lobulus haud ex ipsa folii basi sed ad folii altitudinis $\frac{1}{4}$–$\frac{1}{3}$ oritur, cauleque sæpissime divergit) distincta.

Plantæ pusillæ rufescentes, raro viridulæ, arcte repentes, sparsæ (in *Fr. exili* procumbentes substratificatæ) pinnatæ bipinnatæve, aliis ramulis sæpe microphyllis.

Folia imbricata tenuia subplana vel caviuscula, ovata (raro semicordata) rotundata vel sæpe apiculata integerrima, ab apice ad $\frac{2}{3}$–$\frac{3}{4}$ bi- (tri-) loba; lobulus a caule dissitus pro more obliquus, brevi-cylindricus—raro galeiformis, interlobulo triangulari sæpe adjecto; cellulæ plerumque parvæ, pariete incrassato, raro paucæ inferiores majores in ocellum aggregatæ.

Foliola $\frac{1}{2}$ folium subæquantia, subplana, sæpe angusta, raro rotunda, ad $\frac{1}{3}$ v. raro ad $\frac{1}{2}$ bifida, segmentis acutis, integerrima.

Flores plerumque monoici: ♀ terminales. Bracteæ 2–5-jugæ, complicatæ, ad *Scapaniæ* instar distiche patulæ, apice solo decurvulæ, increscentes, intimæ foliis plus duplo longiores, paulo inæquilobæ, lobis omnibus sæpius acuminatis, lobulis idem ac bracteolæ bifidæ segmentis plerumque plus minus incisis raro integerrimis.

Perianthia pro plantulis magna pyriformia, interdum obcordata, triquetra, rostellata, rarissime (e. carinis lateralibus ut videtur duplicatis) 5-carinata, in unica sp. pluricarinata.

Bracteæ ♂ 3–4-jugæ, vel ramulo proprio compresso-globoso tenentes, vel medio ramo foliis consecutivæ.

Hab. In cortice, persæpe alias hepaticas, *Frullanias* præcipue, infestans.

Distr. Species sub 25 cognovimus, in terris tropicis australibusque totis dispersas, unicam (*Fr. Carolinianam* Sull.) in America boreali temperata, nullam in Europa. Ipse perpaucas legi, alias in sylvis Amazonicis, submaritimis præcipue, alias in Andibus inferioribus, vix supra 1500^{m} alt. ascendentes.

A. *Flores monoici.*

44. *Fr. exilis.*—Rigidula plumæformi-pinnata. F. imbricata oblique ovata abrupte minute apiculata, lobulo 3–4plo breviore clavato-oblongo dissito cauli subparallelo; c. minutæ, paucæ subbasales magnæ. Foliola duplo breviora orbiculata fere ad $\frac{1}{2}$ bifida. Br. 3-jugæ, intimæ lobulis bracteolæque segmentis acuminatis, basi 1–2 laciniatis. Per. majuscula subpyriformia triquetra abrupte longirostria.

45. *Fr. compsotera.*—Caules debiles pinnati, aliis ramis microphyllis. F. imbricata ovato-rotunda, lobulo triplo breviore distante subobliquo clavato-oblongo, c. parvulis. Foliola duplo minora subrotunda angulata fere ad $\frac{1}{2}$ bifida, segmentis acutis. Br. 5-jugæ, intimæ lobulis subacuminatis basi subdentatis; bracteola longe oblonga carinata ad $\frac{1}{2}$ bifida, segmentis subacuminatis, integerrima. Per. subemersa pyriformia rotundata longirostria triquetra.

[*Fr. obcordata.*—Parvula tenera pellucida subpinnata. F. arcte imbricata late elliptica suborbiculatave, lobulo distante diagonali clavato papuloso. Foliola parva subovata ultra ⅓ acute bifida. Br. intimæ distiche patulæ subinæquilobæ, lobis apiculatis interdum subserratis ; bracteola profunde bifida integerrima. Per. subemersa obcordata triquetra rostellata.—*Brasilia.*]

46. *Fr. subtilissima.*—Gracillima subbipinnata, ramis raro microphyllis. F. subimbricata ovata acuta, lobulo dissito obliquo longe oblongo pellucido-reticulato, c. parvis subbasalibus majoribus discoloribus. Foliola plus duplo breviora lanceolato-oblonga ad ⅓ acute bifida. Br. 3-jugæ, intimæ lobulis bracteolaque bifida incisis. Per. pro plantula maxima pyriformia triquetra retusula brevirostria.

B. *Flores dioici.*

[*Fr. myosota.*—Hook. f. et Tayl. Lond. J. Bot. 1844, 393. Crebre pinnata, pinnis plurimis microphyllis. F. subrotunda valde concava, lobulo distante parvo brevi-clavato valde obliquo. Foliola cuneato-rotunda ad ½ bifida, segmentis acutis. Br. bijugæ integerrimæ, lobis omnibus cuspidatis. Per. magna pyriformia alte 5-carinata.—*Nova Zeelandia.*]

47. *Fr. duricaulis.*—Caules rigidi opaci laxe pinnati. F. prælate orbiculata mutica, lobulo distante brevi-cylindrico obliquo. Foliola angusta lineari-oblonga ad ⅓ bifida.

44. FRULLANIA EXILIS, Tayl.

Lond. Journ. Bot. 1846, p. 405 ; 'Syn. Hep.' 778.

Hab. Circa urbem *Pará*, variis locis, insula *Marajó*, etc., nusquam a mari remota, in arboribus, præcipueque palmarum truncis. Guiana anglica (hb. Greville).

F 6 × ·45, *lob* ·15–·2, *c* $\frac{1}{100}$–$\frac{1}{80}$; *f^la* ·38 × ·4, ·25 × ·25 ; *br* 1·2 ; *per* 1·8 × ·9^mm.

Pusilla rufo-fusca stratificata ; caules 1½-pollicares procumbentes crebre pinnati, sæpe plumæformes, ramis breviusculis apice attenuatis, decurvo-subsecundis, siccando julaceis.

Folia imbricata (caulina ad ⅓, ramea ad ½ lat. usque) late oblique (vel subsemi-) ovata, basi subcordata, ex apice subobtuso decurvulo minute apiculata ; lobulus 3–4plo brevior a caule dissitus, clavato-oblongus, cauli parallelus v. apice divergens ; cellulæ minutæ et minutissimæ, pariete valde incrassato, 10–12 inter folii basin et lobuli orificium cæteris multoties majores, centro pellucidæ, ocellum sistentes.

Foliola foliis subduplo breviora subimbricata orbiculata (ob marginem inferum recurvum ad speciem late cuneata), fere ad ½ acute bifida, laciniis divergentibus acuminulatis.

Flores monoici : ♀ terminales. Bracteæ sub 3-jugæ, intimæ foliis duplo majores subinæquilobæ, lobis subacuminatis, posticis bracteolæque ad ½ bifidæ segmentis acuminatis basi ipsa 1–2-laciniatis, cæterum integerrimis.

Perianthia pro plantula majuscula subemersa rufa subpyriformia, vel e basi obconica oblonga, triquetra, abrupte longirostria, faciebus omnibus concavis. Calyptra duplo brevior pyriformis tenuiuscula, basin versus 2 cell., medio supero solum 1 cell. crassa, ab apice ad medium usque inæqualiter 4-valvis.

Amenta ♂ rami apicem mediumve tenentia ; bracteæ foliis consecutiva, sensim minores, 3–4-jugæ, equitantes subæquilobæ.

Obs. Folium a basi ad $\frac{1}{4}$–$\frac{1}{3}$ ejus longit., i. e. ad sacculi insertionem usque, plica perangusta (pro lobuli parte basali habenda) auctum. Cellulæ subpellucidæ, utriculo sæpe collapso lineari sinuato, mediæ $\frac{1}{70}$mm longæ, axiales omnes elongatæ, cæteræ marginem versus multo minores ($\frac{1}{80}$–$\frac{1}{100}$mm) subrhombeæ, ocelli basalis magnæ magis pellucidæ.

45. FRULLANIA COMPSOTERA, Spruce.

Hab. Andes Quitenses, ad fl. *Pastasa* superiorem, alt. 1500m, in arbusculis, supra alias *Frullanias* repens.

F ·7 × 5, *lob* ·2, c $\frac{1}{10}$; *f*^{la} ·35 × ·35; *br* 1·5 × ·75, *br*^{la} 1·25 × ·6; *per* 1·65 × ·9; *caps* ·65, *elateres* ·4mm.

Pusilla, e viridi rufescens. Caules $\frac{1}{2}$–1-pollicares prostrati debiles pinnati, ramulis plus minus microphyllis.

Folia imbricata patula decurvula oblique ovato-rotunda mutica, rarissime subacuta, repandula; lobulus a basi ad lobi alt. $\frac{1}{3}$ usque ad plicam angustissimam—medio processum triangularem proferentum, vel non—redactus, dein liber lobo triplo brevior clavato-oblongus incurvus, cauli parallelus vel plerumque suboblique ascendens, subinde evolutus lanceolatus; cellulæ pleræque parvulæ æquilateræ, pariete ad angulos incrassato.

Foliola subimbricata foliis duplo minora subrotunda ad $\frac{1}{2}$ fere acute bifida, segmentis acutis, margine angulato-repanda raro utrinque unidentata.

Flores monoici: ♀ terminales. Bracteæ 5-jugæ distiche patulæ, arcte imbricatæ, sensim increscentes, intimæ foliis duplo longiores complicatæ ad medium fere bilobæ; lobus ovali-lanceolatus acuminulatus subintegerrimus ; lobulus paulo brevior duplo angustior oblique triangulari-lanceolatus subacuminatus basi sæpe subdentatus ; bracteola hinc breviter connata, anguste oblonga complicato-carinata ad $\frac{1}{2}$ bifida, segmentis subacuminatis, integerrima vel utrinque 1-dentata.

Perianthia subemersa pyriformia apice rotundato longius rostellata triquetra, faciebus lateralibus canaliculatis. Capsula in pedicello perianthio duplo longiore majuscula globosa pallide rufa, valvulis ovali-lanceolatis recurvo-patulis, intus papulosis et ab apice ultra medium elateribus elongatis unispiris obsitis.

Amenta ♂ crebra cauligena, folio caulino duplo breviora, compresso-globosa; bracteæ 3-jugæ arcte imbricatæ concavæ, lobis subsemicircularibus ad apicem fere usque connatis. Adsunt bracteolæ.

Fr. gymnotis Mont., proxima, folia habet orbiculata, superiora apiculata; bractearum lobulos serratos.

Fr. subtilissima Lindenb. foliis duplo minoribus ovatis interdum subacuminulatis ; foliolis multo angustioribus lanceolato-oblongis ; lobulis bractearum incisis serratisve, distat.

Frullania myosota Tayl. hb.! (in ins. Auckland, supra Madothecam arctissime repens, ab Hook. f. lecta), nostræ affinis, magis robusta est, valde ramulosa, ramulis plurimis microphyllis, paucis normaliter foliosis apice floriferis (♀). Folia pellucida subrotunda valde concava mutica, lobulo parvo brevi-clavato distante valde obliquo. Foliola cuneato-

rotunda ad ½ acute bifida, segmentis acutis. Flores dioici. Bracteæ bijugæ foliis sat majores, lobo elongato obovato-ligulato, lobulo angustiore, omnibus lobis apice incurvo cuspidatis; bracteola angusta profunde bifida, segmentis rectis subulatis acuminatis, hinc connata. Perianthia magna pyriformia, basi attenuata, compressula alte 5-carinata, facie antica lata depressa.

Obs. The perianth seems to have become 5-angled (from 3-angled) by the duplication of the lateral keels, for all five keels belong to the convex postical face; while the broad, plane, or depressed antical face is entirely ecarinate.

Fr. myosota is referred by Mitten, in Hooker's Handbook of the New Zealand Flora, to *Fr. ptychantha* Mont. The latter is, however, described by himself, and by the authors of the 'Syn. Hepat.' to have obovato-cuneate leaves and a 9-plicate perianth, and must therefore be distinct from the "*Fr. myosota*" I had from Taylor himself.

Fr. pentapleura H. f. et T. (Handb. Fl. N. Z. 537) might seem, from the name, to be the same as our *Fr. myosota*, but is in reality far removed by the semi-orbicular leaf-lobules.

46. FRULLANIA SUBTILISSIMA, Lindenb.

Syn. Hep. 443; *Fr. atrata β subtilissima* M. et. N. Ann. Sc. 1840, p. 333.

Hab. Ad fluvii *Negro* cataractas, in cortice; etiam ad *Caripi*, prope *Pará*, supra *Lejeuneas* repens (R. S.) Guiana Gallica (LEPRIEUR).

F ·35×·25, *lob* ·15, *c* $\frac{1}{50}$—$\frac{1}{45}$; *f*^{la} ·15×·08; *br* ·8–·9 *longæ*; *br*^{la}. ·75×·45; *per* 1·15×·6; *caps* ·3^{mm}.

Gracillima rufescens, tenui strato arcte repens. Caules pollicares laxe pinnati et subbipinnati, ramis brevibus, raro superne microphyllis.

Folia pellucida subimbricata patula decurvula oblique ovata abrupte subacuta vel brevissime acuminulata, basi antica dilatata caulem haud transeuntia; lobulus ad ¼ lobi altitudinis adstans obliquus saccatus elongato-oblongus pulchre reticulatus, processu triangulari inter lobulum et caulem plerumque interjecto; cellulæ parvæ, pariete incrassato intus sinuato, pellucidæ, subbasales paulo majores longioresque coloratæ.

Foliola plus duplo breviora, caule vix latiora, lanceolata vel rectangulari-oblonga, fere plana, ad ⅓ acute bifida, segmentis acutis.

Flores monoici: ♀ in caule ramisque terminales. Bracteæ 3-jugæ sensim increscentes, intimæ foliis plus duplo longiores erecto-patulæ complicatæ paulo ultra ½ bilobæ, lobis oblongis subacuminatis, lobulo paulo minore grosse inciso; bracteola hinc cum bractea connata cuneato-oblonga, ad ½ bifida, segmentis subacuminatis, margine incisa.

Perianthia foliis plus triplo longiora rufa pyriformia retusula brevirostellata alte acute trigona, demum triloba. Capsula foliis fere æquilonga globosa, profunde 4-fida, ad medium usque ab apice elateribus validis obsita.

Androecia ramulo brevi plerumque constantia.

Obs. Fr. subtilissima Syn. Hep. eadem species videretur, descripta est autem "foliis cordato-ovatis," "lobulis horizontaliter vel oblique a caule distantibus," quum in nostra folia basi vix cordata, lobulique etiamsi obliqui nunquam horizontales. Quoad involucrum serratum etc. sat bene conveniunt.

47. FRULLANIA DURICAULIS, Spruce.

Hab. Caripi, prope *Pará*, in aliis hepaticis supra truncos repens.
F ·45 × ·55, *lob* ·15, *c* $\frac{1}{55}$; f^{la} ·2 × ·1^{mm}.

Pusilla purpureo-badia. Caules pollicares validi rigidi opaci (rubri) flexuosi laxe pinnati et subbipinnati, ramis brevibus, nullis microphyllis.

Folia dissita vel subimbricata caviuscula oblique suborbiculata, latiora quam longa, mutica, antice caulem transeuntia, vix semicordata, ad $\frac{3}{4}$ biloba ; lobulus 3-plo brevior obliquus brevi-cylindricus curvulus, processu triangulari inter lobulum et caulem ; cellulæ fere minutulæ, inferiores paucæ majores discoloresque.

Foliola plus duplo breviora, caulo vix latiora, lineari-oblonga ad $\frac{1}{3}$ bifida, segmentis erectis subacutis, basi recurva apice incurvantia.

Flores haud visi, sine dubio dioici.

Fr. Martiana G. Syn. Hep. 448, nostræ ob folia transverse orbiculata similis, differt lobulis clavatis et foliolis ovatis.

II. JUBULA, Dumort.

Jubula Dum. Syll. 36 (1823), § 1. *Jubulotypus*, excl. § 2. *Ascolobium*. *Frullania*, Raddi ; Nees et Syn. Hep.

Plantæ speciosæ virescentes elatiusculæ prostratæ implexæ et substratificatæ, dichotome vel pinnatim ramosæ. Cellulæ caulis 8 in diametro, c. corticales sub 32-seriatæ, facie quadratæ vel rectangulares, internis vix diversæ nisi breviores et opaciores. *Folia* majuscula incuba bipartita ; *lobus* anticus sat latus planus, ad lineam diagonalem super caulem incurrentem insertus, pro more pulchre dentato-spinosus ciliatusve ; *lobulus* minutus saccatus, a caule spatio sub 5 cell. distans, replicatus patensve, basi externa spina tenui calcaratus (in *var.* inermis), haud raro evolutus lanceolatus acuminatus ; *cellulæ* parvulæ mediocresve subequilateræ, ambitu opacæ, pariete autem tenui. *Folium axillare* (ad rami originem) ex p. caule, ex p. ramo insidens ; lobulus 0 vel (ubi revera adsit) a lobo distans, ramo solo accretus. *Foliola* duplo breviora, plana, subrotunda, bifida, paucispina integerrimave. *Flores* monoici : ♀ innovationibus duabus oppositis—raro una sola—suffulti. *Bracteæ* unijugæ complicatæ inæquilobæ, utraque innovationi subflorali adnata, a bracteola bipartita carinata liberæ. *Pistillidia* tenuia, persæpe solitaria binave, rarissime 3–4-na. *Perianthia* trigono-obpyramidata, vix rostellata, ubique inermia. *Calyptra* napæformis, dimidio infero late tubularis 2 vel 3 cell. crassa, supero abrupte subglobosa tenuis. *Pedicellus*

perianthio subduplo longior, sat crassus, tener, cellulis oppositis bistratis 20-seriatis—axialibus majoribus 4-seriatis (interstitiis crucis figuram ostendentibus), corticalibus parvulis 16-seriatis oblongo-tabulatis conflatus; apice autem in capsulæ basin insigniter dilatatus, carnosus pallidus, pedicelli apophysin (forma sphæræ segmentum) sistens, vertice ipso (*i.e.*, facie supera) cellulis quadratis pluriseriatis, ad lineas diagonales cruciatas ordinatis constans. *Capsula* globosa, a basi ad $\frac{1}{4}$ (vel ad $\frac{1}{3}$ fere) semicircumferentiæ—sc. ad apophysis apicem usque—integra, deinde quadrivalvis; valvulæ rufo-badiæ validæ recurvæ, tota fere facie interna (subrugosa) elateriferæ; cellulæ valvularum bistratæ, exteriores tabulatæ pachydermes, incrassationes validas ad latera monstrantes; c. strati interioris multo minores, compressæ, toto ambitu flavido-incrassatæ, cavitate pellucida, unde valvulæ poris magnis perforatæ videantur. *Elateres* 50–56 cujusque valvulæ, prælongi tenuiusculi, basi angusta adfixi, apice lato truncato obtuse quadrato, helice sat valido arctius contorto, folliculo tenuissimo cito dissoluto. *Sporæ* elateribus duplo latiores, minute tuberculosæ. *Andræcia* ramulis spicæformibus constantia; bracteæ diandræ.

Habitatio et Distributio. Species unica, sat variabilis, hucusque cognita in saxis humectatis umbrosis crescit. In Hibernia austro-occidentali clarissima Miss HUTCHINS eam primum reperit; nuperius in Britanniæ variis locis, juxta oras occidentales, inventa est, necnon in America boreali, subtropica præcipue (*Virginia*, *Carolina*, *Mexico*). Per terras tropicas totas dispersa videretur, rara tamen. Ipse prope *Killarney* Hiberniæ etiam ad pedem montis *Tunguragua* Andium Quitensium legi.

* This fine genus is certainly distinct from both *Frullania* and *Lejeunea*, and is in some respects intermediate between the two genera. It agrees with *Lejeunea* in the bracts of the female flower being adnate to sub-floral ramuli (or innovations),—a character not found in any *Frullania*; also in the incurrent (not transverse) leaves, whose spinoso-dentate margin quite recals the subgenus *Odonto-Lejeunea*, and has no parallel in *Frullania;* nor are there distinct trigones at the cellular angles, as in every *Frullania*. The pedicel agrees exactly with that of *Lejeunea* in consisting of *two* concentric strata of conterminous (not alternate) cells, arranged so as to form a cross on the transverse section of the pedicel (4 axial, and 16 smaller peripheral series of cells); only the apex of the pedicel is more dilated than in any *Lejeunea*, shewing a quadrate, plane, or slightly concave surface, traversed by a great number of diagonal lines (the limits of the quadrate cells) crossing at right angles. On the longest diagonals, viz., those joining the basal angles of opposite valves, I have counted in a capsule of inordinate size as many as 32 cells, and they are never fewer than 22; besides a few minute thickened cells set at each angle, like a gusset, with the effect of preventing any rupture of the apophysis below

the valves. But in *Frullania* the cylindrical portion of the pedicel consists of *four* concentric strata of *alternating* cells (*i.e.*, there are 8 cells on the diameter of a section), and no cruciate arrangement is traceable. *Jubula* agrees with *Frullania* in the axillary ramification, the saccate lobule, and the mono-tetragynous ♀ flowers. It has one character not found in any species of either *Frullania* or *Lejeunea*, viz., the presence of an antical elobulate leaf at the insertion of every branch, seated partly on the stem, partly on the branch, corresponding to the similarly posited leaf in *Bazzania*, *Blepharostoma*, &c.

1. JUBULA HUTCHINSIÆ (Hook).

Jungermania Hutchinsiæ, Hook. Brit. Jung. t. 1; Engl. Bot. t. 2480; *Jubula Hutchinsiæ* Dum. Comm. 212.

Hab. per insulas Britannicas, semper fere ad super humectatas. *Killarney*, variis locis (D^na^ HUTCHINS, TAYLOR et ipse, &c.) *Ballinahasig* prope *Cork* (WILSON); *Dolgelly*, *Wales* (RALFS, WILSON, &c.); in spelunca ad oras *Dunoon*, *Argyle* (GOURLIE et LYON). Ejusdem speciei varietates proveniunt ex America boreali (*Mexico*, &c.), necnon ex Andibus æquatorialibus et insulis Malayanis.

F 1·6×1·1, 1·1×0·8; *lob* ·25×·1; *c* $\frac{1}{40}$–$\frac{1}{52}$; *f^la^* ·8×·8, ·8×·7, ·65×·75; ·6×·6; *br lob* 1·8×1·0; *br^la^* 1·6; *per* 1·9×·95; *br* ♂ ·55^mm^.

Majuscula, læte viridis, prostrata, tegeticulas latas sistens, raro substratificata. Caules 1–3-pollicares, laxe et subflabellatim ramosi, ex parte pinnati, ex parte dichotomi, subgeniculati, ramis ♀ sub flore innovando furcatis, raro innovatione unilaterali auctis.

Folia subimbricata subplana, late oblique ovata, apiculato-acuta cuspidatave, basi exceptâ, argute spinoso-dentata, ad marginem anticum præcipue, spinis 2–12, pro more brevibus triangulari-acuminatis, interdum longioribus et ciliiformibus, ad folia ramea paucis raro nullis, basi antica dilatata non autem cordata, caulem haud perfecte obtegentia, postice ad lobuli insertionem sinuata; lobulus a caule spatio 4–5 cellularum dissitus, eidem subparallelus (processulo brevi rarissime interposito) saccatus, brevi-digitiformis, lobo 5–6 plo brevior, basi externa (ore) cilium sub 5 cellulas longum ad calcaris instar deferens, haud raro evolutus subulatus lanceolatusve acuminatus; cellulæ parvulæ, ad angulos haud (vel lenissime) incrassatæ, subpellucidæ, inferiores subelongatæ, lobulum versus latiores discoloresque. Folia inferiora minus, superiora (florem ♀ versus) magis dentata. Folia axillaria (sc. quæ ramos subtendunt) subantica, cæteris latiora, magis symmetrica, late subcordato-ovata acuminulata, vel integerrima vel subspinosa, lobulo nullo, rarius parvo-dentiformi evoluto. Ad floris ♀ dichotomiam nullum folium axillare adest.

Foliola subrotunda subplana, basi acute decurrentia, apice ad $\frac{1}{2}$ usque bifida, segmentis cuspidato-acuminatis, conniventibus, margine spinis paucis longis ciliata vel inermia.

Flores monoici: ♀ in ramo terminales, ex innovationibus oppositis simplicibus, bracteis basi *adnatis*, dichotomiales. Bracteæ intimæ foliis sublongiores, profunde bilobæ, complicatæ, lobis oblique lanceolatis acuminatis spinosis laciniatisve, postico duplo (vel perpaulo) minore; bracteola fere bipartita carinata, lobis tenuiacuminatis spinosis. Folia

bracteis proxima iisdem parum diversa, lobulo majusculo evoluto, &c., conformia, ad quartum par usque; folia tamen quinti paris infra florem lobulo saccato plerumque gaudent.

Perianthia foliis duplo longiora, pyriformia, vel potius anguste obpyramidata, alte tricarinata, faciebus depressis vel antica medio obscure carinulata, apice rotundato-truncato obscure rostellata, demum trifida, ubique lævissima.

Amenta ♂ spiculis cauligenis folium collaterale plus minus excedentibus constantia; bracteæ sub 6-jugæ, foliis plus duplo breviores, laxiuscule equitantes, late emarginato-bilobæ, inferne turgidæ, lobis subacuminatis conniventibus, inferiore subminore, integerrimis raro denticulatis; bracteolæ parvæ oblongæ ad ½ bifidæ; antheridia bina.

JUBULA HUTCHINSIÆ (Hook.) var. PINNATA, S.

Hab. in sylva *Canelos*, ad pedem montis *Tunguragua*, in saxis humectatis, socio *Mnio rostrato*.

F 1·2 × ·85, *lob* ·1–·15; *c* $\frac{1}{40}$–$\frac{1}{35}$; f^{la} *caulina* ·6 × ·75, *ramea* ·5 × ·45; *per* 2·4 × 1·25^{mm}.

A planta hibernica typica differt caule stricto, laxe pinnato, pinnis brevibus, fertilibus solis furcatis, colore lurido, &c. Folia basi distincte semicordata superne 6–8-spinosa-ciliatave, spinis sc. pro more 5 ad marginem anticum, 1 ad posticum, 1 ad apicem; lobulo minuto (duplo minore quam in typo) obovato, ore *ecalcarato*. Foliola caulina latiora quam longa. Habitus, e caulibus elongatis strictioribus, certe diversus; caracteres tamen a typicis parum discrepant. Lobulus minutus ecalcaratus etiam in forma Javanica, etc., inventus est. Forsan eadem erit ac *Fr. ciliata* Lg. et Gottsche, Syn. Hep. 775 (pro varietate *Fr. Hutchinsiæ* quoque habenda?), in Andibus Meridæ a Moritz lecta; quum tamen cum descriptione data minus bene convenit, hoc non ausim asseverare.

Var. SULLIVANTII, Spruce.

Frullania Hutchinsiæ Sull. Musc. Allegh. 271.

Hab. ad rupes humidas in Carolina et Virginia (SULLIVANT!)

Humilis, lurida, subdichotome ramosa. Folia nisi pro apiculo terminali (neque constanter præsente) inermia:—raro advenit ad ramorum apicem folium unum alterumve obsolete dentatum; lobulus pro ratione major, inflatus, ecalcaratus. Foliola integerrima.—Vars. *Javanica* et *Mexicana* Syn. Hep., inter hanc formam et typum exacte fere mediæ sunt, foliis nunc integerrimis nunc paucidentatis ludentibus, lobulo utplurimum ecalcarato. Quare pro speciei valde variabilis varietatibus jure habendas censeo.

After repeated examination of numerous forms of *J. Hutchinsiæ*, I am compelled to conclude that they constitute but a single very variable species. The most striking varieties are those above described. Its distribution confronts us with a problem not easy of solution. In various localities along the western coasts of England, Wales, Scotland and Ireland it grows in some abundance, and fruits freely. Elsewhere in Europe it has not yet been met with; but what we regard varieties of the same species exist in the warmer parts of North America, and in regions adjacent to the equator all round the globe. The question then arises

whether the British Isles may be its original home, or rather some spot in the torrid zone:—a question into which I have not here space to enter, and I must relegate to a separate memoir the results arrived at by collating the parallel instances of a great many other species of plants.

III. LEJEUNEA, Libert.

Ann. gén. sc. phys. (1820); Dumort. Comm. bot. p. 111; G. L. et N. Syn. Hep. p. 308, ex p.—*Bryopteris* Nees.—*Thysananthus* Lindenb.—*Ptychanthus* Nees.—*Phragmicoma* Dum.—*Omphalanthus* Lindenb. et N.—*Frullaniæ* sp. Nees. et Mont.—*Jungermaniæ* sp. auctorum.

Plantæ pleræque teneræ, pusillæ, aliæ præminutæ, paucæ robustæ; pro more tenui strato repentes, aliæ species autem stratificatæ, aliæ cæspitosæ et assurgentes pendulæve, colore in plurimis pallido, albescente vel flavo-viridulo, interdum autem badio luridove, rarius lætevirente, vix unquam rubescente. *Caules* teretes, tenuiculi, rarius sat validi, pinnatim ramosi, raro plumæformes, aliquando ex parte (raro ubique) dichotomi, *rami omnes infra-axillares*, sc. foliorum basi externa contigui. *Folia* alterna complicato-biloba, ad plicæ basin inferius decurrentia, deinde sursum incurrentia; lobi sat lati vel angusti, anticus major, incubus, ad lineam diagonalem vel fere rectam—rarissime subtransversalem—super caulem incurrens, posticus (*i.e.*, lobulus) simili modo insertus, incurvus et ventricosus, raro planus, margine valde vario, integerrimo, plus minus serrulato denticulatove, interdum dentato-spinoso-ciliatove, rarissime laciniato, superficie lævissima, vel e cellulis convexis papulosa, interdum muriculata, raro echinata. *Cellulæ* in plerisque subæquilateræ, mediocres parvulæve, aliquando minutæ, pro m. leptodermes, trigonis angularibus raro conspicuis; in paucis speciebus c. majores, cæteris parvis interpositæ, in ocellum subbasalem, raro in lineam mediam aggregatæ, in paucissimis per totam paginem æqualiter sparsæ. *Foliola* in omnibus fere præsentia, in perpaucis nulla, in divisione priore (*Holostipæ* nob.) integra, in posteriore (*Schizostipæ* nob.) bifida, magnitudine formaque in diversis speciebus valde varia, radicellas pallidas fastigiatas, raro stellatas, a tergo proferentia vel calva. *Flores* dioici vel monoici (rarissime paroici). *Andræcia* plerumque ramulis amentiformibus pallidis constantia, haud raro tamen in caule ramove posita, foliis normalibus consecutiva; *bracteæ*

subæquilobæ diandræ—rarissimo casu triandræ—in paucis autem (*Dicranolejeuneis*, *Drepanolejeuneis* et *Cololejeuneis*) monandræ. *Rami fœminei* raro simplices et vel brevissimi vel in aliis speciebus elongati; sæpius ramulo infraflorali (innovatione)—vel ramulis duobus oppositis—simplicibus vel iteratim innovando-floriferis, aucti. *Bracteæ* foliis caulinis plus minus diversæ, planilobulatæ, bracteola subæquimagna interjecta (in *Cololejeunea* deficiente); bractea intima (saltem) —vel utraque in floribus dichotomialibus—innovationi (ubi adest) adnata, ab axi florifera vix non omnino libera; ubi autem ramus ♀ simplex est, bracteæ plurijugæ adveniunt. *Perianthium* a bracteis liberum, leptoderme, rarissime perfecte teres et subcylindricum, vel compresso-planum, plerumque pyriforme a fronte subcompressum et in aliis trigonum, in aliis 4–5-gonum, in paucis pluricarinatum, angulis carinisve lævibus vel vario modo armatis, apice interdum in cornua auriculasve productis, vertice perianthii ipsius pro m. rostello turbulari aucto. *Pistillidium* constanter *solitarium*, stylo tenui longe persistente. Calyptra subduplo brevior obovata tenuis, in speciebus robustioribus autem basi constricta subcarnosa, demum apice subregulariter 2–3-valvis. *Pedicellus* brevis pallidus, ad maturitatem perianthio solum 2–3-plo longior, teres, cellulis stratis duobus concentricis (4 cell. in diametro, 12 v. 16 in longitudine) constans, in sectione transversa cruciformis; cellulæ leptodermes, axiales 4-seriatæ majusculæ, periphericæ minores 12-v. 16-seriatæ, omnes in stratis ordinibusve horizontalibus (16 v. 20 cujusque ordinis) ædificatæ, ita ut pedicellus in sicco plerumque nodoso-articulatus, ad nodos geniculatus vel non, evenit; superne autem in capsulæ basin abrupte dilatatus est, apice ipso (subquadrato) cellulis laxis cruciatis (ad diagonales intervalvulares 12-v. 16-nis) constans. *Capsula* globosa, eadem fere structura ac. *Frullaniæ*, pallida tamen, utplurimum tenera, valvulis in dehiscentia recurvis, demum autem (capsula evacuata) tam siccis quam humectatis persæpe in floris *Lilii candidi* formam conniventibus; strato interiore albido flavidulove, superficie inæquali et ad speciem spongioso, vix ad valvularum basin usque protracto. Elateres a capsulæ apice ad vel paulo ultra dimidium inserti, persistentes, pro m. pallidi, tenui-cylindrici, apice dilatato quadrato-rotundo; helice tenui plana, simplice, raro bipartita, arctiuscule, vel interdum valde indistincte torta, 20–200 cujusque capsulæ. Sporæ magnæ (diam. $\frac{1}{24}$—$\frac{1}{20}$ mm) e viridi-

badiæ, globosæ v. oblongæ, pressione mutua polyhædræ, tuberculosæ.*

The genus *Lejeunea*, reconstituted as above, to contain all the strictly monogynous *Jubuleæ*, is well distinguished from *Frullania* by (1) the branches being contiguous to the *outer* base of the leaves, *i.e.*, infra-axillary; (2) the usually rhomboidal or ovate lobule being either plane or ventricose, but never (as in *Frullania*) either galeate or *inversely* saccate —shaped like a bell or a glove finger—except in the very rare case of the British *L. calyptrifolia* and 3 or 4 allied tropical species, where the lobule (larger than the lobe !) is lengthened out into the shape of a hollow horn or club; (3) *the monogynous* ♀ flowers; (4) the innovations, where present, as they are in the great majority of the species, being adnate to the ♀ bracts; (5) the pedicel cruciate on the section, only 4 cells (not 8) across, quasi-articulate when dry and mostly geniculate at the joints. There are other differences of minor importance. Its diagnosis from *Jubula* I have already indicated under that genus.

It is only in the robuster species that the stem of *Lejeunea* is composed of many layers of nearly homogeneous cells, as in *Frullania*. In nearly all the more delicate species the cortical layer is of wider and more pellucid cells (oval on the section) than the axial layers. Thus, in *L. lunulata* (Web.) the stem has a distinct cortical layer of about 10 series of large pellucid cells, whereof those of the antical and postical faces are broadest. The inner, or axial cells are thrice as slender, hexagonal on the section, and in 3 concentric layers, so that the whole stem is 8 cells across. In *L. læta*, L. et L., the stem is only 6 cells across, the large cortical cells 7- or 8-seriate, and the thrice narrower interior cells about 30-seriate. These are typical cases. In the very minute species the axial cells are fewer. As the leaves are in all cases an extension of the outermost layer of the stem, or branch, where the cortical cells are larger than the inner, the texture of the leaf also is comparatively lax.

While every branch is infrafoliar at its origin, neither the suprajacent leaf nor its collateral underleaf is at all modified by the branch, which may correctly be said to subtend the leaf, instead of the leaf subtending the branch, as in *Frullania*, *Porella*, *Lepidozia*, and other pinnately-branched genera, where the axillary leaf is distinctly modified.

The lowest point of the complicate leaf is the base of the fold. In two of the more conspicuous subgenera, *Archilejeunea* and *Odontolejeunea*, each leaf is inserted on the stem on two lines meeting below at an angle, resembling a narrow letter V, and diverging but slightly from parallelism to the axis of the stem—the lobule on the lower line, the lobe on the upper, and (although usually much larger) not ascending higher on the stem than the lobule, but at the antical base abruptly dilated and semicordate. This indeed is the typical mode of leaf-insertion throughout the genus, with such differences as are induced by the lobule being very much smaller than the lobe, or becoming obsolete, and sometimes by the nearly transversal insertion of the lobe on the stem. The latter character is, however, very rare, and is never so marked as obtains throughout the genus *Frullania*, if we except the small subgenus *Cololejeunea*, where the

* De habitatione et distributione Lejeunearum videas post subgenerum descriptiones.

leaf is inserted on an exceedingly narrow base, the fold is often nearly parallel to the stem, or is not unfrequently flattened out, and the lobule proper is represented by a marginal tooth some way above the base of the leaf, or is quite obsolete.

The leaves are infinitely more varied in outline than those of *Frullania*, being in some species broader than long, in others narrow and almost subulate; and although quite entire in more than half the number, yet leaves toothed in various ways—sometimes even ciliate or spinose—are frequent; while in *Drepanolejeunea palmifolia*, Mart., they are so deeply laciniate as to be almost pinnatifid. The smooth surface, prevalent in most *Lejeuneæ*, becomes scabrous in certain subgenera, and in a few is even echinate or setulose, *e.g.*, in the *Cololejeunea calcarea* of Europe and its Javanese ally *C. venusta*, Lac.; also in *Trachylejeunea acanthina*, Spruce, from the Andes, and *Tr. papillata*, Mitt., from New Zealand.

It is in the subgenus *Odontolejeunea* nob., with its large spinoso-dentate leaves, recalling those of a *Scapania*, that we find the nearest allies of *Jubula*. Some species, indeed, have leaves so like those of *J. Hutchinsiæ* that were it not for the large and nearly flat lobule—as contrasted with the small saccate lobule of *Jubula*—they might on a merely cursory view be referred to that genus. Other features common to both have been already pointed out.

Modifications of the lobule in *Lejeunea*, although useful for distinguishing species, are rarely available as subgeneric or sectional distinctions—for the organ itself is liable to become obsolete in many species, and in all is variable in size—except in the case of the horn-like lobule of *L. calyptrifolia* and its allies, and in the subgenus *Ceratolejeunea*, where the lobules of the two lowest leaves on a branch—rarely of any upper leaves—are swollen out into a large kidney-shaped bag, involving the diminished lobe, and perforated in the centre of the depressed upper face. This curious structure is found to have originated in the lobule having been chosen as the nidus of certain minute insects, whose eggs or larvæ are occasionally found within the sac; but as it is limited to certain species of the group, where it is a constant feature, while from others it is as constantly absent, and in a few it exists in only a limited degree; as moreover, I have occasionally seen these abnormal sacs in all stages without any occupant, and have noted an initial enlargement of the lobule while both leaf and branch were still so young as to be quite rudimentary; I cannot doubt that the "utriculi" (as they have been called) have in many cases become inherited, and are as necessary to be taken into account in describing a species as any other part of the plant. This is a parallel case to that of the ant-inhabited sacs of *Tococa* and other Melastomaceæ.* In a few species of *Lejeunea* the lobule is itself bilobed, but the segment next the stem is very rarely styliform, after the manner of *Frullania*.

The texture of the leaves is thinner and tenderer than in *Frullania*, and corresponds more to that of *Jubula*. The cells are mostly subæquilateral hexagons (in reality short hexagonal prisms) and of medium size, or rather small; scarcely ever to be called large, but not unfrequently minute. The leaves of certain species are, however, ocellate near the base by the interposition of a group of larger cells; very rarely are similar

* I may have to return to this subject when I come to treat of the probable origin and use of the inflated or saccate leaf-lobes which occur normally in *Lejeunea*, *Frullania*, and a few other genera of hepaticæ.

large cells arranged in a beaded line, like the "false nerve" of *Frullania Tamarisci;* or, in the subgenus *Stictolejeunea*, solitary, and scattered over the leaf at equal intervals, as in the dotted leaves of a *Hypericum*. Trigones, so constantly present at the angles of the cells in *Frullania*, are comparatively rare in *Lejeunea*. The cells of the lobule are much smaller than those of the lobe immediately overlying them, so that one cell of the latter will sometimes cover 3 to 5 cells of the former.

The underleaves are either entire (*Holostipæ*) or bifid (*Schizostipæ*)—a most important difference, dividing the genus into two primary, and for the most part strictly definite groups, each of which includes many natural subgenera. The *Holostipæ* belong almost exclusively to the tropics and southern hemisphere, only a single species (*L. Mackaii*) reaching our own shores, and two or three others the southern states of N. America. Although far less numerous in species than the *Schizostipæ*, they are divisible into several well-marked groups. The underleaves show several other modifications, the principal of which are constant in each subgenus. A small and very natural subgenus, *Cololejeunea* nobis, has the underleaves altogether absent, even from the involucres; but tufts of radicles are (or may be) produced at the base of every leaf. A still more remarkable group, consisting of two small subgenera (*Diplasiolejeunea* and *Colurolejeunea*) has duplicate underleaves, one to each side-leaf. I know of no parallel case in any other genus of hepaticæ. Radicles are often copiously developed on the underleaves of all prostrate *Lejeuneæ*, especially of those that inhabit living leaves of trees. In *Odontolejeunea* they spread out in the form of a closely-rayed star, but in most other subgenera they are fascicled, or brush-shaped, and in the robuster species, with assurgent stems, are rarely present except on the creeping caudex.

The inflorescence is about equally divided between monoicous and dioicous. It is paroicous in only a very few, chiefly of the robuster, species; autoicous almost throughout some subgenera that are mainly foliicolous; dioicous in most species of certain ramicolous subgenera of cespitose habit, and in a few species of several others. The andrœcia in a few subgenera exist solely in the form of minute whitish catkins; in others they are terminal or medial on the branch or stem, the bracts being continuous with the normal leaves and scarcely differing from them in size, but nearly equilobed, and rather cymbiform than complicate; in many subgenera, however, both forms co-exist, sometimes on the same plant. The ♂ bracts are diandrous in the great majority of species, the interpolation of a triandrous bract being exceedingly rare; a few subgenera, however, are constantly monandrous, as already indicated in the generic character, and in one subgenus (*Harpalejeunea*) the antheridia are either solitary or twin in nearly every species. The antheridia are globose, and the stipes slender; where there are two together, one is larger than the other and overarches it on a longer incurved stalk.

The ♀ flowers are always terminal on a branch, or (very rarely) on the main stem. The flowering branch, whether long or short, may be either perfectly *simple*, which is the case in comparatively only a few species, or *innovant, i.e.*, continued by an innovation originating immediately beneath the perianth, and in many cases itself again and again innovated and floriferous at each successive apex. The singular feature in *Lejeunea* is that *the innermost bract is always attached* (*adnate*) *to the innovation*, and is quite free from the floriferous axis except at the antical basal angle. This kind of

inflorescence has usually been considered *lateral*, in the "Synopsis Hepaticarum" and elsewhere. In reality it is a sort of uniparous, or monotropous cyme; for a very little observation suffices to convince us that the flowering branch terminates with the apical flower, and that its apparent continuation is a lateral branchlet, often taking nearly the same direction. In some cases the innovation (as it truly deserves to be called) diverges considerably, and then its true origin is obvious. Not unfrequently there are two innovations, one adnate to each lateral bract, and thus a dichotomous inflorescence is generated. A simple ♀ branch is rarely found in the same subgenus as an innovant one, but there are cases where the two types of structure must necessarily stand side by side; where two species agree so nearly in every other respect that they cannot possibly be placed in different subgenera. Such cases exist in the groups I have called *Prionolejeunea*, *Trachylejeunea*, and *Leptolejeunea*.

Where innovations are present, the true bracts are mostly reduced to a single pair; but when absent, the bracts may be considered plurijugous, the lower ones passing insensibly into normal leaves, if the ♀ branch be long enough to bear any such. In all cases the bracts are leaves, modified in much the same way as in *Frullania*, except that they were never united into a cup-like involucre. They are indeed rarely exactly opposite, so that although one of the pair may be connate with the intervening bracteole, the other will remain free from it; and it is only in *Drepanolejeunea* and *Leptolejeunea* that I have seen both bracts commonly so united.

The usually pyriform and abruptly rostellate perianth goes through many phases of form, for a full description of which I must refer to the descriptions of the subgenera, some of whose most important characters are drawn from them. In a few species it is as perfectly flattened as that of *Radula;* in a good many others it is much compressed, but with a more or less salient postical keel, or with two or more keels; in others, we find it keeled also in front, and almost regularly pentagonal; in a few others pluricarinate, and in a very few, perfectly terete and ecarinate. The keels may be either a simple fold, acute or obtuse, or they (especially the lateral ones) may have a salient wing, which is often toothed, or spinose, or ciliate; and in a good many species they are dilated at the apex into an auricle or an ascending horn. In some species the perianth goes on growing after fruiting, especially at the base (so as to become spuriously stipitate), and assumes a purplish tinge, in which the calyptra participates.

The pistillidium is uniformly solitary—a character not known in any other genus of foliose hepaticæ, and the slender style is persistent. The calyptra is above half the length of the perianth, and nearly as wide, obovate or pyriform, thin in texture throughout, or incrassated only at the very shortly tubular base. In dehiscence it is sometimes bivalvular at the apex, and often trivalvular, with one valve narrower than the other two.

The pedicel, when full grown, is very little exserted, being only twice or thrice as long as the perianth. It is cylindrical, and is built up of cells in regular horizontal tiers. A transverse section shows 4 large axial cells, each the quadrant of a circle, so that their adjacent walls take the form of a cross; and 12 (or 16) smaller peripheral cells, 3 (or 4) exterior to each axial cell. And now we have to note a curious correlation of structure, not easily to be explained. In the *Holostipæ*, or entire-

stipuled *Lejeuneæ*, the pedicel is 16 cells in length, *i.e.*, it consists of 16 superposed tiers of cells; each tier contains 20 cells (4 inner, 16 outer); and the apophysis (the dilated apex of the pedicel) has on its cruciform upper surface 16 pairs of square-headed cells on each diagonal. But in the *Schizostipæ* the pedicel is but 12 cells long; each tier has only 16 cells, and the dilated apex is only 12 cells across. It is true that the *Holostipæ* are, as a rule, more robust than the *Schizostipæ*, and both stems and all appendages consist of more cells; yet there are a few robust species of the latter which still preserve the same proportions in the pedicel. The numbers given above are the normal ones, and (as in the structure of every other organ) there will be exceptions; but the following are all I have hitherto noted.—In *L. robusta*, Mitt., one of the largest species of the genus, in the centre of the 4 series of large cruciate cells a row of very slender cells is interposed, thus making the pedicel 5 cells (instead of 4) across, although the peripheral cells are still the normal number, 16. In *L. inflexa*, Hpe., one of the *Schizostipæ*, instead of the usual 12 rows of peripheral cells, I have once found 13; the odd row of cells interposed between two groups of three rows each. In some of the minuter species one can make out only 10 or 11 tiers of cells in the length; and in the *Holostipæ* the tiers sometimes fall one or two short of 16; but these aberrations are rare. In the dilated head of the pedicel the number of cells is more apt to vary than in the cylindrical portion; and the cells filling the quadrants between the diagonals are by no means so distinct, or so clearly attributable to the pedicel, as in *Jubula*. The inner base of the capsule is indeed often partially torn up, when the elaters are released from it, and they in their turn sometimes leave their annulated heads sticking to it.

The cells composing the pedicel are all formed before the capsule bursts through the calyptra, after which there is no further addition to their number, and the pedicel attains its full length by the elongation of the cells, so that, from being at first broader than long, they speedily become thrice as long as broad. In this process the end-walls of each tier of cells undergo no change, but the vertical walls are much attenuated and in drying collapse, leaving a nodose articulation, and in the more delicate species a flexure or geniculation, at the top of every tier. In several of the robuster species the cells of the pedicel offer more resistance to lateral shrinkage, and in the dried state the pedicel remains nearly or quite smooth.

The capsule is uniformly globose, much paler and tenderer than that of *Frullania*, and in the smaller species often white when empty. Respecting its structure I have not much to add to what I have already stated in the description of the tribe and genus. It is cloven at maturity into 4 oval-lanceolate valves, down to about $\frac{2}{3}$ of the semi-circumference, rarely to as much as $\frac{3}{4}$. The valves are strongly recurved at the moment of dehiscence, and retain that position in a few of the more robust species; but in the great majority, when the spores are ejected, the valves close again and slightly overlap each other, so as to resemble the petals of a white lily. The outer membrane of the valves consists of large thickish cells, more or less rhombic in general outline, though sometimes 5- or 6-angled, and strongly sinuate within from the nodosely-thickened walls; except the marginal cells, which are oblongo-quadrate and only half the size of the inner. The endothecium is either whitish or slightly tinged with yellow or brown. It consists of smaller, thinner, more elongate

cells, with irregularly thickened walls, in a single stratum, or partly—especially towards the middle of the valves—in two or three strata; and it does not reach down quite to the base of the valves. In all cases the surface is unequally papillose, and as it were, spongy.*

The elaters are almost exactly like those of *Frullania* in form and position, but they vary greatly in number, even in the same subgenus, although apparently constant in each species. In *Bryopteris filicina* 50 have been counted on a single valve, in *Br. diffusa* only 30; and some of the minuter *Lejeuneæ* have only 6 or 7—some even only 5—on a valve. The included fibre is simple—very rarely bipartite—thin, broad, and rather closely twisted; in a few species, however, of which our *L. calcarea* is one, the most powerful instruments fail to show any twisting, but only an undulation. The spores are large, globose ($\frac{1}{22}^{mm}$ in diameter) or oblongo-globose ($\frac{1}{22} \times \frac{1}{30}$ or $\times \frac{1}{10}^{mm}$), polyhædral by mutual pressure, but losing their angles when steeped long enough; the sporoderm tuberculose or warty; the nucleus greenish in the fresh state, but turning yellow-brown.

Many dioicous and some monoicous species are, when sterile, reproduced by gemmæ or "propagula," which are round or oval disks (quite like the first growth from the spore of *Anthoceros* †), springing from one or more marginal cells of the leaves, and increasing in size mainly by the bisection of their peripheral cells until they become 6 or more cells broad, when they develop a minute branchlet with a pair of rudimentary leaves from their margin, and drop off, to begin a separate existence. Adventitious ramuli are rarer, but are produced occasionally, even in the minutest species, *e.g.*, in those of the subgenus *Drepanolejeunea*, where they spring from the surface of the leaves, or from any part of the branches. They bear very minute leaves, often reduced to the basal sac.

The subdivision of this vast genus, whether into so-called genera or into sections, has not hitherto been attempted on the basis of a thorough study and comparison of all the species. The few "genera" separated from it by the authors of the 'Synopsis' are like morsels chipped off a block of marble, and reduced to something like symmetry, but leaving the remainder a somewhat rude conglomerate, although it really includes many other well-marked groups—some of them of greater value than those already struck off—and admits of being divided throughout into natural subgenera (or genera, for those who prefer to so regard them). I will briefly review the genera carved out of *Lejeunea* by the authors of the 'Synopsis,' premising that all have entire underleaves except the last (*Omphalanthus*), which comprises both holostipous and schizostipous species.

Their first genus, *Bryopteris*—previously proposed by Nees (Hep. Eur. III.) as a subgenus of *Frullania*—is a natural group enough, distinguished by the robust closely-pinnate stems (with subopposite branches) springing from a creeping caudex; the ♀ flowers on very short and perfectly simple ramuli; the trigono-fusiform perianths; the very numerous elaters, and other characters. An aberrant member is *Br. diffusa*, which is dichotomous throughout, except that the branches are still pinnulate with the ♀ flowers as in the type-species, *Br. filicina* (Hook.), to which the leaves,

* Of *Archilejeunea florentissima*, n. sp. I have noted: Capsula facie interna crebre papillosa, papillis plurimis brevibus, aliis autem in pilum fere elongatis.

† *Cf.* Hofmeister, on the *Higher Cryptogamia*, Tab. i.

perianths, &c., also closely correspond. The Oriental *Br. fruticosa*, Lg. et G., however, I have been obliged to separate as a distinct subgenus, for the ♀ branches are innovant, sometimes forked, and the perianths obcordato-triquetrous, with cristate keels and one or two ridges added on to front and back.

A *Bryopteris* of Nees (*Br. spathulistipa*), and a few new species, constitute the genus *Thysananthus*, Ldng. in 'Syn. Hep.' The character on which it is mainly founded—the fringed keels of the trigonous perianth—is neither very strongly marked nor very constant; but the plants have another and more important character, viz., the presence of flagella—not postical but lateral branches, attenuated and subaphyllous at the decurved and rooting extremity, which brings them into close relationship with a group, consisting of *Lejeunea auriculata*, Wils. (=*Phragmicoma versicolor*, Lehm. et Lg.), *Phragmicoma humilis*, G. (=*Phr. repleta*, Tayl.), *Phr. ligulata*, Nees, and a few others, mostly relegated in the 'Synopsis' to *Phragmicoma*, but some to *Lejeunea*. These all agree with typical *Thysananthus* in habit, rooting flagella, lingulate leaves, repeatedly and closely innovant inflorescence, and trigonous perianths; and only differ in the entire underleaves and perianths. To this group I have applied the name *Mastigolejeunea*, on account of the flagella, which scarcely exist elsewhere in *Lejeunea*.

The next genus is *Ptychanthus*, comprising several species, all Oriental (chiefly Malayan) except one South American, *Ptych. Theobromæ*, n. sp., found by myself on cacao trees near Guayaquil. Their aspect is almost of *Bryopteris*, but more laxly pinnate, and with more distant leaves. A more essential difference resides in the 7–10-plicate perianth, and in the ♀ branches being at least once—sometimes repeatedly—innovant, and floriferous at each successive apex.

Phragmicoma was founded by Dumortier on a solitary species, *Jungermania Mackaii*, Hook. As it stands in the 'Synopsis' it can only be described as an agglomeration of species of various distinct types, one of which (*Mastigolejeunea*) I have indicated above. Of the two sections into which the genus is divided in the 'Synopsis,' the first, comprising those few species with a perfectly complanate perianth, such as *Phr. Mackaii*, *Phr. Guilleminiana*, and *Phr. Bongardiana*, is truly a natural group; but one of the characters assigned to it, "Pedicellus capsulæ in planta exsiccata *lævis*," is no character at all; for the pedicel in these species, as in all other *Lejeuneæ*, is built up of horizontal tiers of cells, which are lengthened out at maturity, and the resistance to shrinkage of the lateral walls is merely a difference of degree, leaving the dried pedicel nearly or quite smooth in several of the robuster species, and nodose at the joinings of the tiers in all the more delicate ones. The definition of "§ 2, *Ptychanthoides*. Perianthium *a latere* compressum, carina dorsali una binisque ventralibus instructum. Pedicellus internodiis (post exsiccationem) tuberoso-geniculatus"* is disfigured by two errors; for the compression of the perianth is not lateral but frontal, as in every *Lejeunea*,—indeed as in all *Jubuleæ;* and the pedicel in some of the species is as smooth as that of *Phr. Mackaii*. Moreover, the "perianth unicarinate above, bicarinate beneath," along with roundish entire under leaves, exactly corresponds to a number of species that figure in the 'Synopsis' not as *Phragmicomæ* but as *Lejeuneæ*,—such as *L. unciloba*, Ldng., *L. clypeata*, Schwein., *L. Leprieurii*, Mont., &c. In *Phragmicoma* is included a

* 'Syn. Hep.,' p. 294.

group (*Acrolejeunea* nob.), represented by many Oriental but few American species, which has the rare character of the perianth being terminal on the stem, or on long branches, without any subfloral innovation. Another group (*Brachiolejeunea* nob.) has the terminal ♀ flower subtended by two opposite innovations, stretching almost horizontally, like a pair of arms, beneath the large pluriplicate perianth, and giving the stem (or branch) the figure of a crucifix. A few species attributed to *Phragmicoma* belong more properly to *Thysananthus*, and others to *Ptychanthus*.

The fifth genus, *Omphalanthus*, Lg. et N., I would limit to the "§ 1, *Amphigastris indivisis*" of the 'Synopsis,' which consists hitherto of but a single species, the *Jung. filiformis* of Swartz, of which *J. geminiflora*, Nees in Mart., Fl. Bras., is scarcely even a variety It is perhaps the most widely distributed of any *Lejeunea* in the wooded mountains of tropical America, from the West Indies to Chili, but is absent from the Amazonian plain. Although it grows scatteredly, creeping over mosses and partly pensile, and is nowhere abundant, it is conspicuous from its long, brown, often nearly simple stems, its very large shield-like stipules, and its rather rigid, ovoid, eplicate perianths. A close ally of this species, although placed far apart from it (in *Lejeunea*) in the 'Synopsis,' is *L. ovalis*, Lg. et N., *Peltolejeunea* nob., which has the same slender serpentine stems, with very few short subopposite branches, the ♀ flowers 1–3 on a very short innovant ramulus, and broad scutate underleaves, so decurrent or cut out at their insertion that the actual base is a parabolic or semielliptic line on the stem; but it differs essentially in the acutely 5-gonal long-beaked perianths, those of *O. filiformis* being very obscurely trigonous when young but terete at maturity, with a depressed apex.

The species placed in "§ 2, *Amphigastris bifidis*" have only a remote affinity with the first. The underleaves, although sometimes nearly equalling the leaves, are bifid at the apex—in only two species, by rare exception, entire—and, instead of being decurrent at the base for half their length, are usually cordate, with free auricles. The very small, tender perianths are not altogether eplicate (as at first described in the 'Synopsis'), and, in the young stage at least, are distinctly 5-gonal at the apex. The authors, indeed, found themselves obliged ultimately to admit species with very distinctly angular perianths, *e.g.*, *O. pterogonius*, *O. lusorius*, &c., and to modify the generic character thus: "perianthium apice obtuse subplicatum vel quinquangulum."* The character thus extended would comprise (besides the so-called *Omphalanthi*) nearly all typical *Lejeuneæ* with bifid stipules, including our own *L. serpyllifolia*. The true affinity of the species of this second section, with minute, closely-set flowers on a uniparous cyme, and usually acuminate leaves, is with many of the *Lejeuneæ*, § *Acutifoliæ* of the 'Synopsis,' with which, therefore, I have combined them to form the subgenus *Taxilejeunea*.

The five genera thus separated from *Lejeunea* comprise scarcely more than one-sixth of the monogynous *Jubuleæ* described in the 'Synopsis,' the whole remainder being consigned to *Lejeunea*, and divided into a number of sections and subsections, a few of which are natural groups, although in most there is a good deal of dislocation, nor do the species always correspond to the sectional character under which they are arranged. Thus, under "§ 1, *Phragmicomoideæ*, Perianthium a tergo *compressum*, ventre convexo, &c.," is placed No. 1; *L. transversalis* (Sw.)

* 'Syn. Hep.,' Appendix, p. 746.

"perianthiis lateralibus obovato-oblongis dorso concaviusculis ventre convexis, margine oreque inciso-ciliatis;" and under "§ 2, *Typicæ*. Perianthium ambitu *teretiusculo* ventre lateribus tergoque etiam carinatis," is placed No. 35, *L. lunulata* (Web.) "perianthiis lateralibus obovatis *compressis* ventre obtuse carinatis apice oreque spinuloso-dentatis." A comparison of the descriptions of the perianths of these two species shows plainly how very near they are to each other. The perianth of *L. lunulata* is in fact as much compressed as that of *L. transversalis*, obtusely keeled beneath, and margined with a similar sharply-toothed wing; so that, on placing the perianths side by side, we at once pronounce them to belong to two closely-allied species, as they really do, although there are differences of ramification and foliage amply sufficient to keep them apart.

The species of *Lejeunea* are perhaps the most elegant and delicate of all hepaticæ. They abound in the wooded plains and mountains of all tropical countries, but are rare and of few species in the temperate zones; and they have been so seldom gathered by any one previously conversant with the order, that they have been less generally studied than most others. Careful observation of their habits, aspect, and structure, in their native forests, as well as in the cabinet, has led me to the conclusion that the entire genus is divisible, and ought to be divided, into subgenera. This task I have set myself, and how far or how well I have succeeded in performing it, I must leave to the judgment of others. I can at least claim that all my subgenera are natural groups, and (as nearly as I could make them) of approximately equal value. Some of them, indeed, seem to me more distinct than most of those separated as "genera" in the Synopsis. I may instance *Stictolejeunea*, which, besides the unique character of the leaves and other appendages being beset with pellucid dots, has the flattened urniform perianth dilated at each apical angle into large round auricles, often bordered with white, that give it a remarkable resemblance to the head and ears of that curious Andine rodent, the chinchilla. *Odontolejeunea*, also, is a very distinct and natural group, of whose affinity to the genus *Jubula* I have already spoken.

Whoever shall carefully study these plants will plainly perceive that several of my *subgenera* of *Lejeunea* are equivalent to certain *genera* of *Jungermanieæ*, of whose right to that rank no one seems to have any doubt. It follows that either some recombination is needed among the latter, or else that the genus *Lejeunea* should be broken up into several genera. Without venturing to decide this knotty point, I would suggest that although, when the hepaticæ of the whole world, or of a notable portion of its surface, are under consideration, a good deal of subdivision may be found requisite; for a local flora or a limited area, too many genera will tend to produce confusion rather than precision, especially where several of the genera are monotypic; so that, on the whole, it seems desirable to make our genera as comprehensive as possible. For the sake of reconciling both views of the question, I have named all my subgenera by prefixing to the word *Lejeunea* some characteristic term—thus, *Sticto-Lejeunea*, from the dotted leaves: *Prionо-Lejeunea*, from the finely serrated leaves; *Diplasio-Lejeunea*, from the two-ranked stipules, &c. For groups previously separated as genera which I adopt, wholly, or in part, as subgenera, I have retained only so much of the name as may conveniently be added on to *Lejeunea*, thus *Bryo-Lejeunea* for *Bryopteris*, *Thysano-Lejeunea* for *Thysananthus*, &c. This merely for uniformity; but, whether as genera or subgenera, it matters not which name, of each pair of synonyms, is adopted.

CONSPECTUS SUBGENERUM.

I. LEJEUNEÆ HOLOSTIPÆ (*foliolis integris*).

§ 1. *Caules basi ipsa matrici haustoriis fasciatis v. scopæformibus repentes, pro majore parte autem liberi, assurgentes pendulive, fereque arhizi, vel, in paucis speciebus laxe repentibus, hic illic radicellosi. Folia in plerisque integerrima, in paucis apice dentata. Perianthia varia.*

A. *Folia vel punctata vel lineata (falsinervia). Per. compressa, apice insigniter biaurita.*

1. STICTO-LEJEUNEA. F. etc. e cellulis majoribus pellucidis, inter normales subæquidistantibus, punctata.
2. NEURO-LEJEUNEA. F. e cellulis majoribus discoloribus uniseriatis (moniliatis) a basi adusque vel ultra medium quasi-nervata.

B. *F. cellulis omnibus subconformibus, nec punctata nec lineata.*

a. *Rami ♀ innovando-floriferi, pro more monotropi, raro primum dichotomi dein monotropi.*

a_1. *Foliola orbiculata ovaliave dimidio infero in caule decurrentia.*

3. PELTO-LEJEUNEA. Per. pentagono-obpyramidata.
4. OMPHALO-LEJEUNEA. Per. fere teretia ecarinataque.

a_2. *Foliola basi sæpius angusta inserta, nec decurrentia.*

* *Per. argute 4–5-carinata, carinis rudimentarie alatis scaberulis.*

5. ARCHI-LEJEUNEA. F. rotundata foliolaque integerrima, lobulo majusculo rhomboideo sæpius subplano integerrimo.

** *Per. 7–10-carinata lævia.*

6. PTYCHO-LEJEUNEA. Caules elongati laxepinnati, flagellis 0. F. acuta foliolaque apice plerumque spinulosa.

*** *Per. trigono-prismatica.*

† *Alii rami apice flagellari radicantes. Rami ♀ valde confertiflori, monotropi.*

7. MASTIGO-LEJEUNEA. Per. carinis inermia. F. foliolaque integerrima.

7_1. THYSANO-LEJEUNEA. Per. carinis spinosa. F. foliolaque apice spinulosa.

†† *Rami flagelliformes nulli.*

8. DENDRO-LEJEUNEA. Per. obcordato-oblonga triquetra, carinis lateralibus cristatis. Rami ♀ interdum dichotomi. F. foliolaque apice argute serrata.

b. *Rami ♀ simplicissimi brevissimique.*

9. BRYO-LEJEUNEA. Elata plumæformi-pinnata v. 2–3-pinnata, in unica sp. iteratim dichotoma, semper autem cladocarpica. F. apice acuminato serrata. Per. fusiformia triquetra inermia.

c. *Rami ♀ simplicissimi sæpe elongati.*

10. ACRO-LEJEUNEA. Vage ramosa. F. conferta obtusa integerrima. Per. v. 4–5-carinata v. 7–10-plicata, inermia.
11. LOPHO-LEJEUNEA. Laxe subpinnata. F. subimbricata rotundata v. subacuta integerrima. Per. compressa 4-carinata, carinis late alato-cristatis.

d. *Rami ♀ brevissimi, innovatione subflorali minuta simplice aucti.*

12. PLATY-LEJEUNEA. Elata, badia, serpentino-repens subramosa. F. magna late lingulata integerrima. Per. valde compressa, margine ciliata, facie postica subobscure carinulata, carinis paucispinis inermibusve.
13. ANOPLO-LEJEUNEA. Humilis pallida. Per. vix compressa 5-carinata, omnino inermia.

e. *Caules ramique fertiles apice simpliciter v. sæpius iteratim dichotomi (brachiati), flore ♀ in axillis, ♂ sæpissime hypogyno.*

14. BRACHIO-LEJEUNEA. Per. parum compressa 3–10-carinata inermia. F. fere semper integerrima.
15. HOMALO-LEJEUNEA. Per. valde compressa fere planissima, margine inermia. F. utplurimum apice argute dentata.
16. DICRANO-LEJEUNEA. Per. compressa, obcordata, margine ciliato-alata, postice convexa inermiaque v. subspinulosa. F. apice dentata.

§ 2. *Caules arctissime repentes, haustoria disciformia e cujusque folioli basi proferentes. Folia foliolaque sæpius toto fere ambitu argute dentata. Perianthia obcordata valde compressa, dorso convexo lævia, margine alato-cristata.*

17. ODONTO-LEJEUNEA. Foliola apice integra, in *O. L. Peruviana* sola sæpe biloba. Flores omnium, *O. L. chærophylla* excepta, dioici.

II. LEJEUNEÆ SCHIZOSTIPÆ (*foliolis bifidis*).

§ 1. *Foliola foliis alternis tributa.*

A. *Perianthia compressa, antice ecarinata, postice unicarinata, apice obcordata, margine spinulosa.*

18. PRIONO-LEJEUNEA. Pusillæ. Folia acuta, margine (rarius etiam facie) muriculata. Foliola parva bifida pro more integerrima. Rami ♀ simplices v. innovantes. Flores persæpe monoici.

B. *Perianthia haud v. minus compressa, postice bicarinata, carina antica conspicua obsoletave; in paucis turgida omnino ecarinata.*

a. *Perianthia sæpissime ad marginem et carinas armata—papillosa, muriculata, spinulosave, carinisque interdum apice horizontaliter spiniformi-dilatatis—rarius inermia.* Plantæ pusillæ minutæve, raro mediocres. Foliola persæpe minuta, raro mediocria, in unica *Trachy-L. acanthina* magna.

* *Foliola vel subrotunda ad medium circiter bifida, segmentis subacutis; vel late cuneata obcordato-emarginata-bilobave (in unica* Harpa-L. holostipa *integra), segmentis rotundatis.*

19. CROSSOTO-LEJEUNEA. Parvulæ, concinnæ depresso-cæspitosæ monoicæ. Folia supra lobulum divergentia, acuta crenulata facie papulosa. Foliola 2-plo breviora, sæpe utrinque unidentata, ultra ½ bifida, segmentis patulis subacuminatis. Rami ♀ iteratim innovati; bracteæ complicatæ parvilobulatæ subdenticulatæ. Perianthia subcompressa 5-carinata, carinis ala incisa fimbriatis. Br. ♂ minusculæ diandræ.

20. HARPA-LEJEUNEA. Pusillæ minutæve depresso-cæspitosæ, ramis sæpe arcuatis. Folia hamata fornicatave plerumque subacuminata, interdum crenulata subserrulatave, lævia asperave, nonnunq. ocellata, lobulo majusculo turgido ; cellulæ minutulæ leptodermes planæ vel conico-prominulæ. Foliola 3–7-plo minora, in aliis obcordato-cuneata, aliis rotunda ad ½ bifida. Fl. monoici vel dioici: ♀ in ramo brevi terminales, innovatione (plerumque simplice) suffulti ; bracteæ lobulatæ raro complicatæ subcrenulatæ ; bracteola biloba, vel truncato-retusa. Perianthia sæpe pro ratione maxima pyriformia 5-carinata, carinis sæpius scabris vel etiam spinosis. Amentula ♂ brevia tenuia; bracteæ parvæ 1–2-andræ.

20$_1$. STREPSI-LEJEUNEA. Prioris sectio (?) differt habitu robustiore, foliis apice decurvo-tortilibus; foliolis majoribus dimidium folium æquantibus; perianthiis latioribus subulato-carinatis lævibus; bracteis magnis sæpe plurijugis.

21. TRACHY-LEJEUNEA. Majusculæ prostratæ, in vivo pallidæ aqua repletæ, in sicco sæpe fasciculæ, caule valde tenaci colorato pinnatim ramoso, ramis sæpe arcuatis. Folia decurvo-fornicata sæpius subacuta celluloso-crenulata-serrulatave, in unica specie spinosa, facie plerumque asperula, in paucis muricato-asperrima, sæpe ocellata, lobulo parvo; cellulæ mediocres parvæve subpachydermes. Foliola plerumque foliis 2–7-plo minora integerrima v. rarius spinulosa—in *Tr. L. acanthina* foliis fere majora spinosa. Flores omnium fere monoici. Rami ♀ brevissimi, in plurimis simplices, in perpaucis innovatione simplice aucti; bracteæ elongatæ hamatæ denticulatæ lobulatæ complicatæ (vel non); bracteola angusta—raro latior—breviter bifida integrave denticulata (in *Tr. L. acanthina* argute bispinosa). Perianthia sæpe colorata subclavata rotundato-truncata compressa, carinis 5 tenuibus vel subulatis papillosis, in paucis speciebus tota facie aspera; in *Tr. L. acanthina* autem fere rotunda sublævissima. Bracteæ ♂ paucijugæ diandræ.

** *Foliola bipartita, segmentis setaceis divergentibus* (*in* L. palmifolia *erectis*); *raro solum bifida, segmentibus subulatis.*

22. DREPANO-LEJEUNEA. Pusillæ minutæve laxe reptantes. Folia dissita decurvo-hamata angusta (2–4-plo longiora quam lata) lanceolata acuminata sæpe papulosa raro ocellata, crenulata subspinulosave (in *Dr. L. palmifolia* paucisque aliis pectinatim laciniata), lobulo fusiformi turgido; cellulæ parvæ vel subminutæ subleptodermes. Foliola minuta bipartita, cruribus setaceis, in *Dr. L. hamatifolia* solum bifida, cruribus subulatis. Flores omnium fere dioici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis sat majores, concavæ (vix complicatæ) subæquilobæ spinulosæ cum bracteola intermedia angusta bifida basi connatæ. Perianthia 5gono-obpyramidata, carinis raro inermibus plerumque superne spinulosis, apiceque spiniformi quasi-cornutis. Androecia longispica; bracteæ ad carinam celluloso-moniliatæ, monandræ.

23. LEPTO-LEJEUNEA.—Pusillæ tenui strato in maculas sæpe orbiculatas crescentes. Folia subdissita plana anguste oblonga rotundata subacutave, raro apice 2–3-fida, persæpe ocellata, lobulo 2–4-plo breviore subplano; c. mediocres, pariete subincrassato. Foliola parva bipartita, cruribus setaceis (raro ad cell. unicam redactis). Fl. plerumque monoici. Rami ♀ brevissimi sæpissime simplices, in paucis innovatione simplice aucti; bracteæ subæquilobæ interdum serrulatæ,

cum bracteola bifida alte connatæ. Per. obpyramidata 5-carinata, carinis apice truncato-dilatatis subcornutisve. Br. ♂ paucijugæ diandræ.

b. *Perianthia superne 4–5 angula, angulis apice in cornua erecta vel varie patula sæpeque prælonga protractis.*

24. *Cerato-Lejeunea.*—Humiles vel sat robustæ, sæpe dense late depresso-cæspitosæ lurido-rufæ plus minus nitidæ pro m. vage ramosæ. Folia paulo imbricata oblique ovata oblongave, apice decurvo (in sicco subinvoluto) varia, superiora sæpius acutiora et haud raro dentata—rarius toto fere margine serrulata—basi sæpius ocellata; lobulus parvus inflatus, ad ramorum basin autem persæpe cum lobo in utriculum magnum convolutus; cell.-parvulæ v. fere minutulæ subplanæ. Foliola in pusillis parva ad ½ bifida, in elatioribus sæpe magna reniformia apice bidentata, fere semper integerrima. Fl. monoici v. dioici: ♀ terminales, hinc vel utrinque innovati; bracteæ foliis subsimiles magis dentatæ; bracteola ovalis bifida. Androecia plerumq. ramulo proprio constantia brevi-v. longispica.

c. *Perianthia in aliis ecarinata inflata, apice 4–5-cristata-auriculatave vel inermia; in aliis superne 4–5-angulata, angulis lævibus papulosisve. Rami ♀ innovando-pluriflori, vel (in Macro-Lejeuneis) simplices uniflori.*—Plantæ pallidæ flaccidæ laxe textæ, aliæ inordinate elongatæ. Folia sæpissime acuta, lobulo perparvo nullove. Foliola magna mediocriave, in perpaucis parva. Bracteæ pro m. denticulatæ. Amenta ♂ lateralia minuta incurva.

25. TAXI-LEJEUNEA.—Elatæ humilioresve albido-virides pellucidæ, laxe pinnatæ, tenui strato repentes pendulæve. F. parum imbricata ovato-triangularia sæpe subacuminata raro rotundata, apice serrata integerrimave, lobulo persæpe obsoleto; cellulæ mediocres majusculæve leptodermes fere vacuæ. Foliola sæpe magna raro parvula, basi cordata rotundatave, apice breviter—raro ad vel ultra ½—bifida. Florescentia (in omnibus?) monoica. Flores ♀ in ramo iteratim innovando parvifolio seriatim secundi, quasi-laterales, raro ad 2–1 redacti; bracteæ lanceolatæ pro more denticulatæ, lobulo parvo nullove; bracteola ovalis bifida raro integra. Perianthia sæpe parva pellucida obconica vel pyramidata lævia vel apice 4–5-cristulata.

§ 1. *Codonocolea.*—Perianthia parva tenerrima obconica ecarinata vel ipso apice carinulas 4–5 (sæpe cristatas) ostendentia.—Folia magna sæpius apice serrata. Foliola sæpe maxima cordato-reniformia, apice levissime emarginata v. etiam integra, raro bifida.

§ 2. *Pyramidocolea.*—Perianthia submajora a medio—raro fere a basi—5-angula, angulis apice ecristatis.—Folia mediocria majusculave, rarius apice subserrata. Foliola foliis 2–3-plo minora, apice ad ⅓–½ bifida.

26. MACRO-LEJEUNEA.—*Taxi-Lejeneæ Codonocoleæ* e perianthiis parvis inflatis apice solum corrugatis affinis, differt ramis ♀ simplicibus unifloris innovatione carentibus, florescentia dioïca, et foliis acuminatis sæpe convolutivis.—Caules interdum inordinate elongati. Foliola maxima cordata.

27. OTIGONIO-LEJEUNEA.—Perianthia habet fere *Codonocolearum* nonnullarum, fere teretia, apice solo carinata, carinis in auriculam erectam integram v. fissam—v. saltem in umbonem—protractis; necnon

ramos ♀ utplurimum multifloros ; differt autem statura pusilla foliis etc. in sicco difficillime emolliendis; foliolis parvis vel minutis; perianthiis pro m. involucro elongato immersis suberostribus, calyptræ stylo alte protruso rostellum simulante.

d. *Perianthia omnium carinata inermia, sæpissime lævia, in paucis ad carinas tuberculosa.*

* *Foliola maxima, raro solum majuscula.*

28. HYGRO-LEJEUNEA.—Elatæ speciosæ laxe textæ tenerrimæ, valde hygrophoræ, pallidæ, in sicco sæpe fuscescentes, inodoræ, pro m. dense stratificatæ, ramificatione varia ex parte dichotoma. Folia sat magna subimbricata semicordata acuta, raro obtusa rotundatave, a lobuli parvuli inflati apice divergentia, sæpius celluloso-crenulata, facie sublævia; cellulæ mediocres convexulæ, pariete vix incrassato, Foliola sæpissime maxima, paucis sp. integra, plerisque apice bidentata vel breviter bifida. Flores omnium dioici : ♀ in ramo hinc vel utrinque innovando sæpeque prolifero terminales ; bracteæ complicato-lobulatæ subacuminatæ sæpius crenulatæ raro spinulosæ ; bracteola obovata emarginata vel subbifida, in unica integra. Perianthia pyriformia subcompressa 5-carinata, carinis fere lævibus apice rotundo-prominulis—in unica sp. insigniter auritis. Amenta ♂ sæpe terminalia brevia; bracteæ mediocres antheridia bina magna fo-ventes.

29. EUOSMO-LEJEUNEA.—Elatiusculæ firmiusculæ pallidæ flavidæve suaveolentes, prostratæ vel pendulæ, laxe pinnatim ramosæ. Folia imbricata devexula semicordato-oblonga rotundata, rarissime acuta, asperula rarius lævia, celluloso-crenulata ; cellulæ mediocres parvæve prominulæ guttulatæ, pariete ad angulos valde incrassato. Foliola foliis fere æquimagna cordato-remiformia-orbiculatave, apice breviter bifida bidentatave. Flores omnium fere dioici : ♀ in ramo iteratim innovando terminales ; bracteæ complicatæ angustilobæ integerrimæ crenulatæve ; bracteola angusta (in unica sp. orbiculata) apice bidentata. Perianthia elongata alte 5-carinata, carinis lævibus asperulisve. Bracteæ ♂ pauci-plurijugæ majusculæ diandræ.

** *Foliola mediocria parvave, raro minuta.*

30. PYCNO-LEJEUNEA.—Majusculæ albicantes pellucidissimæ subodoræ, arcte repentes subramosæ. F. confertissima concava semicordato-oblonga rotundata, papulosa, interdum ocellata, lobulo vel mediocri inflato vel prælongo cylindrico-convoluto; cellulæ subparvæ alte prominulæ. Foliola 2-plo breviora reniformia ad $\frac{1}{3}$ bifida. Rami ♀ innovandi; bracteæ longæ incurvæ complicatæ subinæquilobæ acuminulatæ; bracteola lata bidentata vel integra. Perianthia obovata turgida argute 5-carinata. Br. ♂ majusculæ pauci-plurijugæ.

31. POTAMO-LEJEUNEA.—Majusculæ luridæ prostratæ. Folia subimbricata subplana rotundata recte complicata, lobulo majusculo plano, cellulis parvulis. Foliola dimidium folium subæquantia subrotunda ad $\frac{1}{3}$–$\frac{1}{2}$ bifida, segmentis acutis. Rami ♀ breves, innovatione simplice nullave suffulti ; bracteæ foliis subconformes. Perianthia 4–5-gona, apice vel truncata vel carinis apice umbonato-prominulis. Br. ♂ majusculæ sæpe plurijugæ.

32. CHEILO-LEJEUNEA. Humiles depresso-cæspitosæ varie coloratæ, in sicco sæpe luride rufescentes, caule vage ramoso persæpe ramis microphyllis pinnulato. Folia nunquam conferta patentissima semicordato-oblonga rotundata papulosa, integerrima interdum cellulosocrenulata, lobulo semper præsente 3-4-plo breviore turgido; cellulæ parvæ chlorophyllo copioso subopacæ. Foliola 2-4-plo minora subrotunda ad $\frac{1}{2}$ bifida, subintegerrima, segmentis acutis. Ramus ♀ brevior longiorve, in plerisque simplex, in paucis innovatus; bracteæ lobulatæ falcato-divergentes incurvæ integerrimæ; bracteola anguste ovalis breviter bifida v. integra. Perianthia rufa sat compressa, carinis posticis humilibus .obsoletisve sæpe in unam latam fere confluentibus, demum ore bilabiata. Calyptra aurantiaca. Bracteæ ♂ majusculæ pauci-plurijugæ

33. EU-LEJEUNEA. Mediocres vel pusillæ, sæpius virides vel albicantes, pinnatæ vel vagæ. Folia subimbricata vel dissita, ovata ovaliave obtusa rotundatave, in perpaucis acuta, integerrima vel raro cellulosocrenulata, lobulo sæpius parvulo (interdum obsoleto) inflato vel subplano; cellulæ mediocres parvulæve, sæpius planæ pro m. leptodermes, chlorophyllo parco. Foliola raro $\frac{1}{2}$ folium excedentia, plerumque 2–3-plo (in sp. pusillis 4–7-plo) minora, ad $\frac{1}{3}$–$\frac{1}{2}$ (rarius ad $\frac{3}{4}$ usque) fissa, segmentis pro m. subacutis, nunquam late obtusatis. Flores omnium fere monoici: ♀ terminales, innovatione (simplice vel prolifera) suffulti; bracteæ foliis angustiores complicatæ, lobulo parvo nullove, integerrimæ; bracteola plerumque angusta brevissime vel ad $\frac{1}{2}$ usque bifida. Perianthia plus minus pyriformia compressula—in paucis magis compressa obcordataque—5 carinata, carinis raro peracutis, semper inermibus, lævissimis vel perraro tuberculosis. Androecia semper fere ramulo tenui constantia, raro terminalia; bracteæ parvulæ raro plurijugæ.

34. MICRO-LEJEUNEA. *Eu-Lejeuneis Microstipis* similes, minutiores. Folia minuta dissita integerrima vel celluloso-crenulata lobulo vel majusculo $\frac{1}{2}$ folium æquante (nunc obsoleto) vel lobo fere æquimagno, cum eodem ad conchæ instar convoluto; cellulæ parvæ minutæve ($\frac{1}{50}$–$\frac{1}{70}$ mm) sæpe opaculæ. Foliola præminuta profunde bifida, segmentis subulatis. Flores in omnibus fere dioici: ♀ terminales innovati. Perianthia *Eu-Lejeuneæ*.

§ 2. *Foliola nulla; haustoria cuique folio tributa.*

35. COLO-LEJEUNEA.

1. *Physocolea*, perianthiis turgidis argute 5-carinatis, rarissime fere ecarinatis.—Plantæ pusillæ præminutæve fragiles vage v. raro pinnatim ramosæ, caule ramisque ad foliorum insertionem geniculato-flexuosis. Folia dissita, basi perbrevi fere transversâ, subrotunda et vel solum concava (nec complicata) lobulo vix ullo, vel margine postico toto fere incurvo conchoidea; in paucis angustiora acuminataque, lobulo mediocri normali; facie sæpius papulosa rarissime muriculata; cellulæ parvæ leptodermes pro m. obtuse (raro acute) prominulæ. Flores omnium fere monoici. Rami ♀ innovati; bracteæ laxæ foliis vix diversæ, raro complicatæ. Br. ♂ monandræ, in unica *C. L. calcarea* interdum diandræ.

2. *Leptocolea*, perianthiis valde compressis sæpe obcordatis, postice convexis subobsolete 2-carinatis.—Plantæ pusillæ, grandifoliæ autem, sæpe rufescentes. Folia planiora sublingnæformia, normaliter parvilobulata. Bracteæ foliis multo minores complicatæ, altera minuta æquiloba.

§ 3. *Foliola duplicata, i.e., cuique folio tributa.*

36. DIPLASIO-LEJEUNEA. Pusillæ grandifoliæ rufescentes fragiles sæpeque tenuissimæ. Folia plana, insertione peraugusta, dein oblongo-rotunda, infra medium complicata, plica margine bidentata vel subulata-unidentata. Foliola cuneata bifida-partitave. Bracteæ parvæ complicatæ subæquilobæ. Perianthia oblonga prælte 5-carinata.

37. COLURO-LEJEUNEA. A priore differt foliorum lobo inferiore (nec superiore) majore, apiceque in clavam cornuve convoluto-elongato. Bracteæ minutæ integræ sæpe retusæ. Perianthia campaniformia 5-carinata, carinis apice brevicornibus.

Præter hos caracteres essentiales, liceat adducere alios, minus constantes quidem, utiles autem pro subgeneribus Schizostipis discriminandis.

Plantæ elatiores sæpeque grandifoliæ sunt Euosmo-Lejeuneæ, Hygro-Lejeuneæ, pleræque Taxi-Lejeuneæ et Macro-Lejeuneæ, nonnullæ Cerato-Lejeuneæ et Potamo-Lejeuneæ.

Pl. statura mediana: Trachy-Lejeuneæ, Cheilo-Lejeuneæ, Pycno-Lejeuneæ, nonnullæ Taxi-Lejeuneæ, Eu-Lejeuneæ et Cerato-Lejeuneæ, paucæ Colo-Lejeuneæ.

Pl. pusillæ: omnes fere Priono-Lejeuneæ, plures Eu-Lejeuneæ, Cheilo-Lejeuneæ, Otigonio-Lejeuneæ, Lepto-Lejeuneæ, Colo-Lejeuneæ, Diplasio-Lejeuneæ, paucæ Harpa-Lejeuneæ.

Pl. exiguæ minutæve: pleræque Drepano-Lejeuneæ, Harpa-Lejeuneæ, Micro-Lejeuneæ, paucæ Colo-Lejeuneæ.

Folia acuta in Priono-Lejeunea, Drepano-Lejeunea, Crossoto-Lejeunea, in plerisque Harpa-Lejeuneis, Trachy-Lejeuneis, Cerato-Lejeuneis, Taxi-Lejeuneis, in nonnullis Macro-Lejeuneis, Otigonio-Lejeuneis et in paucis Eu-Lejeuneis; obtusata rotundatave in cæteris fere omnibus.

Folia bracteæque apice saltem denticulata serrulatave, vel margine toto fere celluloso-muriculata, in plerisque Priono-Lejeuneis, Trachy-Lejeuneis, Drepano-Lejeuneis, Cerato-Lejeuneis, Taxi-Lejeuneis, et in nonnullis Crossoto-Lejeuneis, Harpa-Lejeuneis, Lepto-Lejeuneis, Macro-Lejeuneis et Otigonio-Lejeuneis; in Trachy-Lejeunea *acanthina* spinosa, in Drepano-Lejeuneis nonnullis pectinatim laciniata.

Folia bracteæque integerrima (v. solum obscurius celluloso-crenulata) in plerisque Pycno-Lejeuneis, Potamo-Lejeuneis, Cheilo-Lejeuneis, Eu-Lejeuneis, Micro-Lejeuneis et Colo-Lejeuneis, Diplasio-Lejeuneis et Coluro-Lejeuneis, sæpeque in Hygro-Lejeuneis et Euosmo-Lejeuneis.

Folia laxe texta, cellulis mediocribus v. etiam majusculis—raro parvulis—pro m. leptodermibus, in omnibus *Hygro-Lejeuneis, Taxi-Lejeuneis, Macro-Lejeuneis*, Otigonio-Lejeuneis, Coluro-Lejeuneis, in plerisque Lepto-Lejeuneis et Eu-Lejeuneis. Folia reti spissiori, e cellulis vel minutis. vel pachydermibus, interdumve magis chlorophyllosis, in cæteris fere omnibus Schizostipis invenimus.

Folia plus minus aspera, e cellulis obtuse, acute, v. etiam setoso-prominulis, habemus in Trachy-Lejeuneis et Pycno-Lejeuneis, in non-

nullis Priono-Lejeuneis, Crossoto-Lejeuneis, Harpa-Lejeuneis, Cheilo-Lejeuneis (gradu minore), in paucis Drepano-Lejeuneis, Enosmo-Lejeuneis et Colo-Lejeuneis. In cæteris fere omnibus lævia sunt, vel e cellulis convexulis leniter papulosa.

Foliola maxima (interdum foliis superficie æquimagna v. etiam majora) in plerisque Hygro-Lejeuneis. Taxi-Lejeuneis codonocoleis, Macro-Lejeuneis, in nonnullis Cerato-Lejeuneis et in *Trachy-Lejeunea acanthina*. In cæteris mediocria, parva minutave.

Foliola, quamvis normaliter bifida, *in paucissimis speciebus integra* inveniuntur, sc. in *Harpa-Lejeunea holostipa*, in *Hygro-Lejeuneæ* speciebus 3, in 2 *Taxi-Lejeuneis* et in *Cerato-Lejeunea* unica. Bracteolæ integræ minus infrequentes sunt, sc. in paucis Cheilo-Lejeuneis, Harpa-Lejeuneis, Hygro-Lejeuneis et Taxi-Lejeuneis.

Rami ♀ *simplicissimi* (s. cladocarpici), sine ulla innovatione, invenimus in Cheilo-Lejeuneis fere omnibus, in omnibus Macro-Lejeuneis (subgenere speciebus paupere), in plerisque Trachy-Lejeuneis et Lepto-Lejeuneis, in multis Priono-Lejeuneis et in *Potamo-Lejeunea polystachya*. Tales rami haud semper perbreves sunt, e contrario in *Cheilo-Lejeunea* folia plurijuga infra florem terminalem haud raro ostendunt. In cæterum subgenerum speciebus omnibus adveniunt flores ♀ in ramo brevi longioreve (rarius in ipso caule) terminales, innovationem e basi proferentes simplicem v. in plurimis iteratim innovando-proliferam. In Taxi-Lejeuneis rami ♀ sunt parvifolii iteratim innovati, floribus confertis seriatim secundis ad speciem lateralibus.

Bracteæ ♂ *constanter monandræ* in Drepano-Lejeunea et Colo-Lejeunea, *in cæteris omnibus Schizostipis diandræ* nonnisi raro casu monandræ, rarissime triandræ.

SUBGENUS I.—*STICTO-LEJEUNEA*, S.

Plantæ elatæ, pulcherrimæ, e viridi albicantes fulvæve, corticolæ et ramicolæ, sæpe ultra matricem horizontaliter porrectes pendulæve, in planum pinnatæ bipinnatæve, sæpe eleganter plumæformes, caule rufo nigrescenteve tenaci cellularum stratis plurimis conflato, foliis cæterisque appendiculis e cellulis majoribus pellucidis inter normales sparsis ad speciem ocellatis porosisve.

Folia sat magna imbricata subplana semicordato-oblonga rotundata integerrima, lobulo præminuto involuto sæpe decurvo-corniformi; cellulæ minutulæ firmæ licet leptodermes, trigonis nullis, subpellucidæ, inferiores elongatæ; ocelli ubique intervallis subæqualibus dissiti: omnes cellulæ parum chlorophyllosæ.

Foliola imbricata, foliis æquimagna sed oblata, reniformia integerrima.

Flores dioici: ♀ ad caulem v. ramum primarium, in ramulo brevissimo, foliis solum unijugis minutis infra florem stipato, terminales, innovatione brevi parvifolia simplice suffulti. Bracteæ foliis fere duplo minores, complicato-bilobæ, altera (interior) major, lobis inæqualibus, altera minor, obcordata, lobis æqualibus; bracteola obovata.

Perianthia foliis caulinis subæquimagna urniformia valde compressa apice profunde biloba, lobis (auriculisve) spathulato-rotundis planis exalatis, sæpe scarioso-marginatis, postice humiliter obtuse unicarinata, capsulâ emissâ bilabiata.

Andræcia vel ramulum totum folio caulino sublongiorem, vel rami primarii apicem tenentia; bracteæ 6–10-jugæ arcte imbricatæ æqualiter biloba.

Inter *Lejeuneas* insignis, solumque cum *Platy-Lejeunea*, e fl. ♀ lateralibus, innovatione simplice suffultis, necnon bractea altera æquiloba comparari potest; differt vero hæc colore badio; caule flaccido pauciramoso; foliis, etc. epunctatis; sed præcipue perianthiis margine ciliato-cristatis, apice exauriculatis. Revera *Neuro-Lejeuneæ* (quam videas) multo magis affinis est.

Hab. In fruticum ramis, in sylvis opacis, secus rivulos præcipue.

Distr. In sylva Amazonica fere tota, in Andibus humilioribus Peruvianis et Æquatorialibus, cordilleræ tam orientalis quam occidentalis, ipse legi. In tota America tropica, ab insulis Antillanis per Braziliam ad Chili usque, reperta est.—Stirpes mere Americanæ, in Oriente nondum visæ.

1. STICTO-LEJEUNEA SQUAMATA.

Jung. squamata Willd. in Web. Prodr. 33. *Lejeunea s.* Nees, G. L. et N. Syn. Hep. 322.

Hab. in fruticum ramulis secus rivulos, rarius in arborum cortice, per Andium orientalium radices, nusquam supra 600 m. ascendens: locis *Tarapoto*, fl. *Bombonasa*, *Pastasa*, etc.; in planitie (quoad formam perfectam) rarior: fl. *Negro* juxta montem *Cocui* (inter Braziliam et Venezuelam limitem), etc.

F 1·2 × ·85, 1·1 × ·8, ·8 × ·6; *lob* ·1 – ·125; *c* $\frac{1}{8\,0}$; f^{la} ·8 × 1·2; *bracteæ lob* ·8 × ·55; br^{la} ·65 × ·55; *per* 1·05 × ·9, *auriculæ* ·35 × ·5; *caps* ·35mm.

Elata, pallide viridis, albescens, raro rufescens, procumbens stratificata. Caules e caudice repente fere liberi, arcte plumæformi-pinnati et subbipinnati, ramis alternis, frondem 2–3 pollices longam, $\frac{1}{2}$ poll. latam, ambitu lanceolatam, efformantes.

Folia late imbricata subplana, tenuia, pellucido-punctata, patula, semicordato-ovata v. ovato-oblonga rotundata, basi antica caulem late transeuntia, postica sinuato-lobulata; lobulus minutus foliis 10-plo brevior ovoideus convolutus, sinu decurvus itaque quasi corniformis, apice (occulto) acuto acuminulatove; cellulæ minutulæ subpellucidæ leptodermes, subæquilateræ, inferiores subelongatæ. Inter cellulas normales interpositæ sunt aliæ duplo majores –pellucidæ, annulo chlorophylli opaco in ambitu—ad ocellorum instar, cellulis normalibus 4 v. pluribus dissitæ, per totum folium æqualiter sparsæ. Eodem modo foliola, bracteæ perianthiaque ocellata sunt.

Foliola imbricata foliis æquimagna sed transversa, dimidio latiora quam longa, cordato-reniformia, apice lato recurva.

Flores dioici: ♀ quasi-laterales, in ramo primario secundariove brevissimo terminales, innovatione simplice pro more brevi (foliis sub 5-jugis) suffulti. Folia rami ♀ infrafloralia minuta unijuga orbiculata. Bracteæ foliis multo minores complicatæ; interna (innovationi adnata) bipartita; lobis obovatis rotundatis, inferiore duplo breviore angustioreque, externa duplo minor obcordata, paulo ultra $\frac{1}{3}$ emarginata, lobis subæqualibus semiobovatis.

Perianthia foliis rameis submajora caulinis vix æquimagna urniformia valde compressa, apice profunde obcordato-biloba, rostello perbrevi in sinu, lobis in auriculas spatulato-rotundas reniformesve, planas sed non alatas, albo-marginatas dilatatis, postice carina parum elevata percursa. Calyptra pyriformis tenuis, cellulis unistratis conflata, ad perianthii sinum attingens, demum inæqualiter trifida. Capsula globosa (emersa mihi non visa).

Plantæ ♂ cum ♀ mixtæ, paulo tenuiores magisque ramosæ. Amenta ramulum totum, v. rami primarii apicem tenentia. Bracteæ sub 10-jugæ, foliis duplo minores, julaceo-subimbricatæ, cymbiformi-complicatæ, obtusæ, ad $\frac{1}{3}$ fissæ, æquilobæ, antheridia bina foventes. Adest bracteola obovata duabus bracteis infimis adscripta, bracteæ autem superiores bracteolis omnino carent.

Obs. Folia ad $\frac{1}{3}$–$\frac{1}{2}$ lat. imbricata, tenuia et quasi vitrea, subopaca tamen, apice albido-scariosa. Rami sæpe tam conferti ut folia ramorum vicinorum contigua v. subimbricata fiunt. Caules tenaces rufescentes subcompresso-teretes, cellulas sub 12 in sectionis diametro monstrantes; cellulæ subconformes elongatæ, corticales coloratæ opacæ magis chlorophyllosæ, interiores pellucidæ.

The normal arrangement of the ♀ flowers is as follows:—From the outer base of the lowest leaf in the interval between two consecutive branches on the same side of the stem springs a ♀ branch, abbreviated to a single pair of minute leaves and their accompanying foliole—all of which are suborbicular and entire—below the involucre. Adnate to the inner and larger bract, and diverging at a small angle from the axis of the ♀ flower, grows out a slender innovation, bearing usually only 5 pairs of small leaves, but sometimes more elongate.

The form above-described, which I consider the perfect state of the plant, is the var. γ *Neesii* of G. L. et N. in Syn. Hep. Their var. α is the following:—

Var. *macrior* (= α *Willdenoviana* et α* *ocellulata* Syn. Hep.) differt a typo statura minore; caule minus regulariter pinnato; ramis sæpe plurimis consecutivis abbreviatis floriferisque; foliis etc. minoribus, caulinis fere elobulatis, lobulo rameorum magis distincto, in situ corniformi, arte explanato quadrato-rotundo.—Hab. prope *Pará* et ad fl. *Negro* superiorem.

2. STICTO-LEJEUNEA KUNZEANA, Gottsche. TAB. III.

L. squamata W. β *Kunzeana* G. in Syn. Hep. 322.

Hab. in M. *Chimborazo* radicibus occidentalibus, e ramis pendula, alt. 1000m.—In Peruvia et Chili legit. cl. PÖPPIG.

F 1·3 × ·8; *lob* ·15; *c* $\frac{1}{50}$–$\frac{1}{40}$; f^{la} ·8 × 1·1–1·2; *per* 1·5 × 1·2^{mm}.

A *S. L. squamata*, valde affini, diversa videtur caracteribus sequentibus.

Elatior, 6–9 pollicaris, e pallide viridi fulva. Caules, e caudice repente subdiviso, a matrice liberi, nigri, in planum ramosi, bipinnati, ramis ramulisque dissitis frondem laxam nec plumæformem efformantes.

Folia parum (ad $\frac{1}{4}$–$\frac{1}{3}$ lat. solum) imbricata, oblonga (nec ovata) basi antica alte semicordata; lobulus convolutus lageniformis, deflexus, cauli contiguus parallelusque (ad *Frullaniæ replicatæ* instar). [Lobulus *L. squamatæ* decurvus est, sed a linea horizontali parum divergit

cornuque simulat.] Cellulæ multo majores, ocelli tamen minus conspicui nec tam symmetrice dispositæ ac *L. squamatæ*.

Foliola fere conveniunt, lateribus tamen incurva, [nec apice recurva ut in *L. squamata*].

Perianthia longiora sunt, auriculis valde dilatatis pulchre albo-marginatis, contiguis vel etiam paulo imbricantibus.

Obs. The branches and branchlets are several pairs of leaves apart, which leaves room for from 2 to 4 fertile ramuli between two consecutive branches; whereas in *L. squamata* more than one is never seen. The ♀ flowers are found on the primary branches more frequently than on the stem, but in *L. squamata* are wholly confined to the latter.

SUBGENUS II.—*NEURO-LEJEUNEA*, S.

A *Sticto-Lejeunea* differt statura humiliore foliis foliolisque minoribus; caule flexuoso minus regulariter pinnato; foliis divergentibus, e cellulis axialibus magnis pellucidis moniliatis, falsinerviis (nec tota superficie punctatis, sicut in *Sticto-Lejeunea*), lobulo sat conspicuo recto; foliolis minoribus late cuneatis; floribus ♀ in ramo longiore terminalibus (dichotomialibus); bracteis foliis submajoribus, fere conformibus; perianthiis cuneatis obcordato-bilobis (auriculis oblongis complanatis anguste alatis), valde compressis, facie antica planis, postica bicarinatis, carinis subalatis.

Sticto-Lejeunea folia habet tota superficie punctata, flores ♀ quasi-laterales (cladogenos), bracteas minutas, alteram earum æquilobam, perianthium postice obtuse unicarinatum, margine carinisque exalatum; itaque pro subgenere distincto habendam censeo.

Hab. In arborum truncis vetustis, persæpe muscis filicibusque irrepentes.

Distr. Species hujusce subgeneris adhuc cognitæ habitant: 1. *L. catenulata* Nees, in America septentrionali, super *Hymenophyllum ciliatum* et *Neckeram abietinam*, Hook.; 2. *L. Breutelii*, Gottsche, in Antillis; 3. *L. seminervis*, Spruce, ad fl. *Negro* in Brasilia boreali.

1. NEURO-LEJEUNEA SEMINERVIS, Spruce.

Hab. In sylvis fl. *Negro* superioris ad truncos vetustos; prope *S. Gabriel* et *S. Carlos* frequens.

F ·55 × ·35; *lob* ·15; *c* $\frac{1}{10}$; f^{la} ·25 × ·25, ·25 × ·3; *br* ·65 × 45; br^{la} ·55 × ·45; *per* ·9 × ·65, 1·2 × ·9^{mm}.

Plantæ latissime effusæ intricatæ, rufo-badiæ, luridæ v. olivaceo-nigrescentes. Caules 1½-pollicares procumbentes flexuosi confertim pinnati v. bipinnati, ramis inæquilongis sæpe brevibus, fertilibus pro more dichotomis.

Folia arcte imbricata, angulo recto v. majore divergentia, decurva, falcata, oblique (v. semi-) ovato-oblonga rotundata integerrima, a basi ad ½ long. usque cellulis magnis uniseriatis vittata, vittâ angulum sub 70° cum caule efformante, basin versus sinuato-lobulata; lobulus folio 3–4-plo brevior ovalis inflatus, margine incurvo, apice in dentem

linearem acutum involuto producto; cellulæ minutæ subæquilateræ guttulatæ, subchlorophyllosæ, limitibus sat validis, trigonis nullis, inferiores submajores oblongo-hexagonæ, vittæ cellulæ cæteris collateralibus $2\frac{1}{2}$-plo majores ovales pellucidæ.

Foliola contigua v. imbricatula, foliis duplo et ultra breviora, rotundo-cuneata plana, lobulos vix perfecte obvelantia.

Flores dioici: ♀ in innovationum dichotomia terminales—innovationibus raro solitariis, vix unquam proliferis. Bracteæ foliis submajores, eadem fere forma, lobulo tamen explanato parvo ligulato diagonali; bracteola subquadrata, angulis rotundatis, v. obovata.

Perianthia alte emersa, sæpe maxima, foliis plus duplo longiora compressa, obcordato-cuneata, apice profundissime emarginata v. potius biloba, lobis auriculisve rectis, late oblongis rotundatis complanatis rudimentarie alatis, obsolete rostellata, postice bicarinata, carinis humilibus interrupte subalatis conniventibus et in perianthii sinum apicalem confluentibus.

Plantæ ♂ cum ♀ mixtæ, tenuiores, magis ramosæ. Amenta v. ramulo cauligeno constantia v. rami apice (rarius medio) posita; bracteæ 4–6-jugæ majusculæ subrotundæ subæqualiter complicato-bilobæ.

L. catenulata, Nees. (Syn. Hep. 323) folia habet apice eroso-denticulata; foliola minora ("foliis *triplo* saltem minora"); innovationes semper unilaterales; perianthia duplo minora ("$\frac{1}{4}$ lin. vix longiora"), tam lata quam longa.

Obs. At S. Carlos *Lej. seminervis* encircles trees of 1 to 2 feet in diameter from the ground up to a great height, so that they look as if wrapped in dingy brown cloth.

SUBGENUS III.—*PELTO-LEJEUNEA*, S.

Omphalo-Lejeuneæ certe peraffinis, tenuior tamen, fere capillacea, tenerior, colore pallido. Rami (sæpe subopposite) magis dissitiflori. Folia dissita, caule valde convolutiva, oblique ovata pro more acuta; lobulus eo Omphalo-Lejeuneæ haud absimilis, plicæ angulo tamen acutiore; *cellulæ* $\frac{1}{5}$ minores, *papuloso-prominulæ*, *trigonis nullis*. Foliola, qualia *O. Lejeuneæ*, cauli semiadnata, longiora tamen, anguste ovalia, planioraque. Florescentia utriusque sexus fere eadem ac *Omphalo-L.* Bracteæ ♀ foliis duplo breviores acuminatæ apice denticulatæ; bracteola apice bifida. *Perianthia alte acute* 5-*gona longirostria.*—Ultimo caractere, præ aliis, ab *O. Lejeunea* distinguenda.

Habitu *Taxi-Lejeuneæ Pyramidanthæ* satis accedit, caules autem cæspitoso-penduli; folia firmiora, cellulis subduplo minoribus subopacis papulosis; foliola perfecte integra dimidio infero cauli adnata; florescentia dioica, et perianthia valida alte 5-carinata, caracteres subgenericos amplos suppetunt.

Hab. In montibus sylvaticis e ramulis pendula.

Distr. In Andibus Quitensibus (*Chimborazo* et *Guayrapata*) etiam in Columbianis (*Merida*), alt. 1200–3000 m., unica species mihi cognita rarius occurrit.

1. PELTO-LEJEUNEA OVALIS, L. et G. Syn. Hep. 754.

Hab. Ex arborum ramulis pendula, in montibus Andium Aequatoriensium *Chimborazo* et *Guayrapata*, alt. 1200–3000 m.

F 1·0 × ·6, *lob* ·3; *f*^{la} ·8 × ·5; *c* $\frac{1}{60}$—$\frac{1}{50}$; *br. lob* ·5; *per* 1·1 × ·6, 1·25 × ·6^{mm}.

Cæspites densi pallidi penduli. Caules 3–6-pollicares filiformes debiles pinnati parum radicellosi; rami breves distantes, alterni v. suboppositi, sæpe floribus ♀ innovando-secundis quasi-pinnulati.

Folia vix imbricata primum erecto-patula dein decurvo-convolutiva, basi longissima sublongitudinali inserta (*i.e.* antice prælonge decurrentia), semicordato-ovata, acutata vel leniter acuminata acuta (in var. obtusata), e cellulis prominulis tuberculata margineque repandula; lobulus 3-plo brevior subrhombeus trapezoideusve anguste saccatus, plicâ angulum 30°–40° cum caule efformante, recta parum convexa, superne planiusculus v. apice subacuto plus minus involuto; cellulæ minutulæ, firmes, subæquilateræ, incrassatæ, *trigonis* autem *nullis*, solum centro pellucidæ, ambitu chlorophyllo opacæ, inferiores sensim elongatæ flexuosæ, omnes fere extus *convexo-prominulæ*.

Foliola foliis fere æquimagna subcontigua elliptica dimidio inferiore cauli adnata, basi utrinque rotundata, vel hinc semicordata illinc rotundata, plana v. lateribus recurva.

Flores dioici. Rami ♀ 1–2-, v. 3- (raro 4-) flores paulo dissiti, revera terminales, ex innovationibus brevibus apice floriferis—rarissime ex parte dichotomis—ad speciem laterales, seriatimque secundi. Bracteæ erectæ appressæ foliis caulinis duplo minores, ovato-lanceolatæ subacuminatæ apicem versus erosulæ denticulatæve, lobulo perangusto adnato nullove; bracteola oblonga v. obovato-lanceolata apice breviter bifida, segmentis acutis obtusisve.

Perianthia foliis subæquilonga pyriformia—vel a basi brevi obconicâ obovata—apice obtusato longirostria, alte acuteque 5-gona, opaca, firma.

Pl. ♂ simpliciores. Andrœcia spiculis pallidis cauligenis, rectis vel subcircinatis, f. caulinum subsuperantibus, constantia; bracteæ foliis 4–5-plo minores 3–5-jugæ, raro plures, laxiuscule equitantes, saccatæ v. potius galeiformes, ore emarginatæ v. integræ, antheridia bina magna brevi-pedicellata foventia; bracteolæ ovales vix decurrentes.

Var. *obtusata*.—In M. Guayrapata; etiam in Chimborazo, sed rara.

F 1·5 × ·65; *lob* ·6; *f*^{la} 1·15 × ·6; *br* ·65^{mm}.

Forma major fuscidula, caulibus sæpe subsimplicibus. Folia longiora obtusata—raro etiam rotundata—lobulo majore. Foliola elongata ovali-linguæformia.

SUBGENUS IV.—*OMPHALO-LEJEUNEA.*

Omphalanthus, Ldng. et Nees, Syn. Hep. 303, pro parte; *Phragmicoma*, Mont. Cent. II.; *Lejeunea*, Mont. in d'Orbigny Voy.

Plantæ elatæ flaccidæ flexuosæ, prostratæ pendulæve, flavescentes, parum ramosæ, ramis sæpe suboppositis, caule apice elongato vermiculari.

Folia subconferta erecto-patula valde decurvo-concava—interdum caule subconvolutiva, suborbiculata integerrima; lobulus majusculus subrhombeus caule incurrens subsaccatus, apice brevi incurvo; cellulæ parvulæ planæ pachydermes, trigonis maximis, centro pellucidæ.

Foliola foliis æquimagna orbiculata, paulo latiora quam longa, dimidio inferiore cauli adnata, valde recurvo-concava.

Flores dioici: ♀ ad ramos breves innovatos seriatim secundi, sæpeve solitarii. Bracteæ foliis minores, lobulo parvo obsoletove; bracteola foliolis subangustior, emarginata.

Perianthia paulo emersa, pyriformi-cylindrica, inflata ecarinata—juniora tamen obscure trigona—apice rotundato depresso demum 3—plurifida, laciniis inflexis.

Androecia spicam brevem cauligenam sistentia; bracteæ 6-jugæ, raro plures, parvæ, ultra medium bifidæ subæquilobæ.

Hab. In saxis arborumque ramulis.

Distr. Hujus subgeneris unica species cognita Americana est, per tropicos novi mundi late distributa, nullibi vulgaris; montes humiliores diligit, supra 2000^{m}. vix ascendit, in planitiem rarissime descendit.

1. OMPHALO-LEJEUNEA FILIFORMIS (Sw. Prodr. p. 144, sub *Jung.*)

Omphalanthus filiformis, N. et *O. geminiflorus* N.

Hab. In saxis arborumque ramulis Andium Orientalium tam Peruvianorum quam Æquatoriensium (M. *Campana*, Fl. *Pastasa* super, &c.) vix ad 2000 m. alt. usque; in planitie rara (caput fl. *Pacimoni*).

F 1·0×1·1, *lob* ·35; *c* $\frac{1}{10}$; *f*^{la} 1·0×1·3, ·9×1·05; *br. lob* ·8×·6; *br*^{la} ·6×·5; *per* 1·3×·6, ·75×·6; *amenta* ♂ 1·0–1·7^{mm}.

Plantæ elatæ 2–4-pollicares pallidæ v. flavidæ, opacæ, prostratæ pendulæve sæpe in stratum densum protensæ, in sicco interdum rufobadiæ; caules flexuosi flaccidi parum ramosi, raro pinnati, ramis pro more brevibus alternis v. per paria approximatis.

Folia late imbricata erecto-patula, basi media (ad plicam) acute decurrentia—plicâ angulum sub 45° cum caule efformante—semicordato-orbiculata vel-oblongo-rotunda, ex apice et margine postico valde decurvis cochleato-concava, a basi ad $\frac{1}{3}$ subrecte complicata; lobulus caule incurrens ovato-rhombeus subsaccatus, margine transverso inflexo, raro plano, medio unidentato (dente lobuli apicem sistente); cellulæ parvulæ subconformes, guttulatæ pachydermes, trigonis maximis, centro pellucidæ, chlorophyllo in annulum sinuosum congesto, fere planissimæ, minute asperulæ.

Foliola late imbricata, foliis æquimagna, oblato-orbiculata, e margine late recurvo convexa, dimidio inferiore cauli adnata, facie interna, supra hilum rhiziniferum externum, profunde foveolata, rhizinis validis fasciatis.

Fl. dioici: ♀ ad ramos perbreves, sæpe oppositos, innovandos, seriatim secundi, 2 v. 3, v. haud raro solitarii. Bracteæ foliis minores, dimidio inferiore complicatæ, lobo obovato rotundato, lobulo angusto lineari-rhomboideo v. obsoleto; bracteola longe brevior obovata orbiculatave, e margine infero recurvo spathulata, apice retusa v. triangulari-emarginata.

Perianthia foliis breviora longiorave inflata, fere teretia parum compressa sordide rufa, opaca, strato cellulularum tamen unico constantia

obscurissime trigona, pyriformia, vel a basi obconica subcylindrica, apice rotundato depresso, centro minute perforata, demum 3-plurifida, laciniis inflexis. Calyptra paulo brevior pyriformis, apice subregulariter 4-fida.

Amenta ♂ in planta propria cauligena, crebra, globosa, oblonga v. spicata; bracteæ 2–10-jugæ foliis 2-plo et ultra minores, subconfertæ basi turgidissimæ, profunde bifidæ, lobis subæqualibus ovato-triangularibus obtusis. Inter *Omphalanthum filiformem*, Sw. et *O. geminiflorum*, M. et N., nullum discrimen invenio.

Flores ♀ ad ramum brevissimum 1–2-vel 3-ni in una et eadem stirpe; ex innovationibus oppositis interdum dichotomiales.

SUBGENUS V.—*ARCHI-LEJEUNEA*, Spruce.

Plantæ sat elatæ speciosæ rufescentes, raro subluridæ viridesve, in sicco tam forma quam colore parum mutatæ, ramicolæ et corticolæ, cæspites v. plagulas dilatatas sistentes, raro aliis hepaticis muscisque consociatæ. Caudex longe repens, caules pro more assurgentes, v. ultra matricem (sæpe fruticis ramulum) patulos stratificatosque v. pendulos, vage—rara subpinnatim—ramosos, ramis plerumque paucis inæquilongis, in pl. ♀ iteratim innovando-elongatis, raro dichotomis, subarhizos proferens.

Folia magna (·75–2·25^{mm})—in unica specie (*clypeata*) parvula—imbricata, subrotunda v. sæpissime oblonga sublinguæformia, valde obtusa rotundatave, nunquam acuta, integerrima; lobulus majusculus (=folii $\frac{1}{3}$–$\frac{1}{2}$) subrhomboideus, acutus, apiculatus, bidentulusve, margine (raro totus) planus integerrimus, ad carinam subinflatus, neque vero saccatus; cellulæ parvulæ mediocresve, raro majusculæ, subconformes, leptodermes, v. pariete ad angulos subincrassato, pellucidæ, solum ambitu opacæ.

Foliola foliis subæquilata, breviora tamen, orbiculata v. reniformia, basi exciso-amplexantia v. cordata, integerrima, haustoria scopæformia rarissime proferentia.

Flores dioici, in paucis monoici: ♀ in ramo iteratim innovando-prolifero terminales, rarissime (in speciebus paucis monoicis) e caulis apice dichotomo, florescentiam magnam, ♀ vel ♂, in furca gerente, ad brachia monotrope innovanda seriatim secundi. Bracteæ foliis parum diversæ, integerrimæ; bracteola integra v. aliarum sp. breviter bifida.

Perianthia emersa pyriformia pellucida, ex apice rotundato retusove (nunquam obcordato) rostellata subcompressa 4 (–5)-quetra—rarissime antice posticeque 2–3-carinulata—carinis raro lævissimis, plerumque ala rudimentaria interrupte limbatis v. saltem exasperatis—nunquam tamen denticulatis ciliatisve.

Andrœcia rami apicem mediumve tenentia; bracteæ pro more plurijugæ foliis paulo minores subinæquilobæ, diandræ.

[*Brachio-Lejeunea* ab *Archi-Lejeunea* differt: *ramificatione* in plantis fertilibus *tota fere dichotoma*, in sterilibus sæpe laxe pinnata; *foliis* sæpe *acutis, lobuli saccati margine* transverso *crenulato; foliolis* sæpe insigniter *decurrentibus; florescentia* normali *paroica et autoica; bracteis denticulatis; perianthiis* raro subæqualiter 4–5-gonis sæpius 7–10-*plicatis, carinis* plicisve omnibus *sublævissimis.*]

Hab. In arborum cortice ramisque. Species humiliores interdum ad arbores pomiferas; majores in sylvis, præcipue fl. Negro humilioribus, valde copiosæ, in plagas prælatas horizontales ad fruticum ramulos diffusæ, e colore rufo necnon statura elatiore insignes, raro aliis Lejeuneis commixtæ. *A. L. Leprieurii* semper riparia palustrisve, interdum arborum ramis irrigatis adnata et ex p. fluitans.

Distr. Per Americam tropicam ab insulis Antillis ad Peruviam australem usque; præprimis in sylva Amazonica (ubi 9 species legi) abundat. In Andibus humilioribus, vix supra 600^{m} ascendens, provenit *A. L. florentissima*, S.; alteras duas species, *L. porelloides*, S. et *L. crispistipula*, S., alt. 1000^{m}, semel vidi. Ex America septentrionali unicam speciem (*L. clypeata*, Schwein.) habemus. Aliæ paucæ species adveniunt in insulis Antillis et Brasilia, quarum 2 (vel plures) etiam in Africa australi habitant. Singula species Asiatica etiam in Brasilia et Peruvia lecta est. Potissimam subgeneris expansionem in America australi esse ex his plane patet.

§ 1. MONOTROPELLA: *ramis ♀ monotrope innovandis; florescentia (in L. Leprieurii excepta) dioica; perianthii carinis pro more scabris.*

A. *Dioicæ, rufescentes. F. basi semicordata.*

a. *Bracteola distincte bifida.*

1. *A. L. porelloides.* Elata. F. maxima elongata linguæformia recte complicata. Foliola suborbiculata. Br. foliis subbreviores; bracteola elliptica ad $\frac{1}{3}$ bifida. Per. vix emersa longe 4gono-obpyramidata, facie antica 1–3 carinulata, postica 2 carinata, margine carinisque posticis angustissime alato-repanda.
2. *A. L. unciloba.* Pr. minor. F. late oblonga sinuato-complicata. Foliola oblata reniformi-orbiculata valde recurvo-cochleata, Br. foliis longiores; bracteola obovata breviter bifida. Per. emersa pyriformia 4-carinata, carinis lævibus v. subasperis.
3. *A. L. badia.* F. semicordato-ovato-oblonga, lobulo magno. Foliola late cuneato-orbiculata. Br. foliis æquilongæ; bracteola magna lanceolato-oblonga apice angusto brevissime bifida. Per. subimmersa cuneato-pyriformia compressula postice alte bicarinata, margine carinisque rugulosis.

aa. *Bracteola apice lato rotundata emarginatave.*

4. *A. L. recurvans.* F. laxe imbricata oblonga, margine antico late recurvo, subrecte complicata, lobulo magno (=f. $\frac{1}{2}$) inflato. Foliola suborbiculata recurvo-cochleata, Bracteola obovata subacute emarginata. Per. emersa pyriformi-oblonga compressula 5-carinata, carinis asperulis.
5. *A. L. crispistipula.* F. late imbricata ovato-elliptica subplana profunde sinuato-complicata, lobulo plus duplo breviore subplano. Foliola reniformia margine sinuato-crispa. Bracteola ligulato-oblonga obtuse subemarginata. Per. alte emersa pyriformia compressa, postice 3-carinata, antice 1–3-carinulata, sublævissima.
6. *A. L. rufa.* F. confertissima semicordato-orbiculata, obliqua et oblata, lobulo 3-plo breviore subplano. Foliola majuscula reniformia fere duplo latiora quam longa, apice valde recurva. Bracteola prælate cuneata rotundato-truncata. Per. subemersa cuneata compressula acute 4-carinata (facie anticâ carinulata), carinis obsolete tuberculosis.

B. *Monoicæ, pallidæ luridæve. F. basi haud semicordata.*

7. *A. L. Lepricurii.* Elata lurido-viridis F. subcontigua falcato-oblonga, lobulo 5-plo breviore subplano. Foliola oblato-orbiculata. Br. foliis minores; bracteola obovato-oblonga rotundata. Per. alte emersa pyriformia, apice depressa, subcompressa 5-carinata, carinis scabris.

† *A. L. clypeata.* Pusilla albido-viridis. F. subimbricata semiovata celluloso-crenulata, lobulo 3-plo breviore subplano. Foliola quadrato-rotunda. Br. foliis majores; bracteola rectangulari-oblonga retusula: Per. late obovata rotundata, antice leviter 1-, postice alte 2–3-carinata, carinis scabris. [America bor.].

§ 2. DIBRACHIELLA: *ramis ♀ pro more apice primum ditropis (brachiatis) dein monotrope innovandis; floribus monoicis; perianthii carinis lævissimis.*

8. *A. L. florentissima.* Foliorum lobulus lobo plus 2-plo brevior. Foliola lobulis æquilonga subrotunda. Per. pyriformia longirostria.

9. *A. L. Crügeri.* F. lobulus lobo 5-plo brevior. Foliola foliis 3–4-plo minora subreniformia. Per. brevirostria.

1. ARCHI-LEJEUNEA PORELLOIDES, Spruce.

Hab. In sylvis fl. *Negro* et *Uaupés*, præcipue in sylvis humilioribus "caatingas" dictis, ad fruticum ramulos; frequens in *San Carlos* vicinia. In Andibus Peruviæ, alt. circiter 1000^{m}, rara.

F 2·25 × 1·25; *lob* ·75 × ·5; *c* $\frac{1}{30}$–$\frac{1}{20}$; f^{la} 1·3 × 1·3, 1·0 × 1·25; *br* 2·0; br^{la} 2·0 × 1·0; *per* 2·0 × 0·8^{mm}.

Elata rufo-badia. Caudex in matrice sæpe longissime repêns, pedalis, caules 2–6-pollicares liberos assurgentes pendulosve—vel persæpe horizontaliter patulos—substratificatos, vage vel subpinnatim ramosos, ramis inæquilongis interdum iteratim innovando-proliferis, proferens.

Folia maxima confertim imbricata, horizontalia vel decurvo-secunda, plana, siccando fere immutata, e basi semicordata oblique elongato-ovato-oblonga, sublinguæformia, rotundata obtusatave, margine antico plano, postico supra medium apiceque recurvo basin versus incurvo; lobulus 3-plo brevior ovato-rhomboideus acutus applanatus (nec inflatus); cellulæ mediocres vel majusculæ, versus mediam basin ampliores, lobuli tamen minutulæ cæteris 2–3-plo minores, omnes subæquilateræ, pariete subincrassato, facie interna subrotundæ, minute sinuatæ autem, granis chlorophylli paucis.

Foliola tenera subplana late imbricata, foliis æquilata subduplo breviora, lobulos tegentia, orbiculata—in formis minoribus sæpe basi subquadrata subcuneatave—apice rotunda retusulave, margine recurvula, a basi ad medium fere usque impresso-canaliculata.

Flores dioici; ♀ in ramo innovando-monotropo—rarissime dichotomo—terminales. Bracteæ foliis caulinis subbreviores lobo ligulato obtusato, lobulo paulo breviore dimidio fere angustiore subappresso triangulari-lanceolato vel late subulato; bracteola æquilonga elliptica vel elliptico-lanceolata ad $\frac{1}{3}$ anguste bifida, segmentis subobtusis, acutis vel raro subacuminatis, sæpe tortellis.—Foliola infrafloralia 2 vel 3 pro more emarginata.

Perianthia bracteis subæquilonga, raro longiora, pyriformia (potius longe tetragono-obpyramidata), 2½-plo longiora quam lata, subcompressa, ex apice retuso brevirostria, facie antica apicem versus humiliter 1-

(raro 3-) carinulata, postice alte bicarinata, carinis marginalibus posticisque angustissime alatis repandisque vel subtuberculatis.

Androœcia in plantâ tenuiore magisque ramosâ, terminalia vel medium ramum tenentia, julacea; bracteæ sub 10-jugæ foliis consecutivæ sed duplo minores, inflatæ, parum inæquilobæ, diandræ.

Var. *longiflora*, Spruce, minor, magis compacta, sæpius subdichotoma. Folia breviora. Foliola fere duplo minora cuneato-orbiculata. Perianthia pro ratione majora emersa obovato-oblonga vel obpyramidata, angulis repando-cristulatis, facie antica superne 3-carinulata; alia magis elongata, fere lineari-oblonga, carinâ anticâ singulâ, pentagono-prismatica.—Ad fl. *Negro*, juxta *S. Gabriel* et *S. Carlos*.

Var. *andina*, Spruce, perianthiis haud raro postice asymmetrice 1-carinatis, sc. vel alterâ carinâ obsoletâ vel carinis 2 posticis approximatis in unam latam dorso subplanam quasi confluentibus.—In M. *Campana* et *Guayrapurina*, corticola.

2. Archi-Lejeunea unciloba, Lindenb.

Syn. Hep. 331.

Hab. In arborum vetustarum cortice, raro in ramulis, secus flum. Amazonum (*Pará*, *Santarem*, *Obidos*, etc.); necnon per totum fl. *Negro* (*S. Gabriel*, *S. Carlos*, etc.). Eandem speciem habuerunt cl. auctores "Syn. Hep." e Brasilia, Peruvia et Mexico (necnon e C. Bonæ Spei ?).

F 1·0 × 0·8, 1·05 × ·75; *lob* ·35 × ·3, ·3 × ·25; *c* $\frac{1}{40}$; *f*^{la} ·6 × ·9, ·6 × ·75, ·5 × ·75; *br* 1·25; *per* 1·5 × 1·0, 1·5 × ·75^{mm}.

Procerula depresso-cæspitosa substratificata flavida vel rufo-badia. Caudex in cortice longe repens, caules subliberos 1–2-pollicares vage ramosos —interdum decompositos—flaccidos proferens.

Folia confertim imbricata planiuscula vel sæpius decurvo-concava, solum basi antica recurvula, late semicordato-oblonga, rotundata, subabrupte sinuato-complicata; lobulus triplo brevior ovali-rhombeus acutus apiculatusve appressus fere planissimus; cellulæ parvulæ subconformes pellucidæ, pariete ad angulos præcipue incrassato, intus plus minus distincte plurisinuatæ, chlorophyllo in annulum congesto.

Foliola imbricata, $\frac{1}{2}$ folium superantia, dimidio latiora quam longa, lobulos totos obvelantia, oblato-orbiculata reniformiave, basi excavato-amplexantia, e margine toto recurvo cochleata.

Flores dioici: ♀ terminales, cum innovatione (raro proliferâ). Bracteæ folia excedentes, ad $\frac{2}{3}$ usque bifidæ, lobo oblongo rotundato, lobulo sæpe vix breviore, angustiore tamen, acuto vel acuminulato; bracteola obovata breviter acute bifida.

Perianthia foliis dimidio longiora, pyriformia, rostellata, compressa, antice depressa apicemque versus interdum 1-carinulata, postice bicarinata, carinis lævissimis vel obsolete tuberculosis, raro magis asperis, demum apice 3–4-fida; cellulæ superiores pulchre guttulatæ, longitudinaliter seriatæ, quasi moniliatæ. Calyptra totum perianthium replens, pyriformis, apice subæqualiter 4-fida, valvulâ quartâ cæteris sublatiore (valvulis 2 connatis constante).

Androœcia in ramis basilaria, media, apicaliave, spicata; bracteæ foliis sensim minores 6–20-jugæ; antheridia bina magna, altero longius stipitato.

Plantula in terris Amazonicis late dispersa, sat variabilis. Forma

grandiolia adest juxta *Obidos* et ad fl. *Caipurá*, lobulo margine supero rotundato, apice in supremis foliis apiculato-acuto, in inferioribus autem solum abrupte acuto vel etiam rotundato.—Altera forma, e fl. *Uaupés*, foliola hic majora lobulos obvelantia, illic per intervalla minora lobulorum apices haud attingentia, habet. Ad *Manaos* fl. *Negro* advenit forma pusilla, lobulis sæpe diminutis, foliolis magnitudine variis; altera ad Pará, in Mastigobryo repens, elongata, foliolis minoribus, lobulos raro obtegentibus.—Formæ insigniores sunt :

Var. *intermedia*, floribunda. Lobulus dimidium folium fere æquans foliolis parvulis raro obvelatus, acutus nec apiculatus. Perianthia postice distincte bicarinata, carinis approximatis inferne obtusis—quasi in unicam latam confluentibus—solum apicem versus magis argutis; margine plus minus scaberula, interdum grosse subserrata.—*Caripi*, prope *Pará*, in cortice.

Var. *unicarinata*. Lobulus parvus, folio 4–5-plo brevior, acutus. Perianthia magis compressa, apice rotundata vel obcordata, carinis posticis parum prominulis sæpissime in unicam obtusam coalitis, margine sublævissima.—*Pará*, in cortice.

3. ARCHI-LEJEUNEA BADIA, Spruce.

Hab. Ad ramulos foliaque viva in "caatingas" fluvii *Uaupés*.

F 1·55 × 1·0, 1·8 × 1·05 ; *lob* ·55 × ·35, ·7 × ·5 ; *c* $\frac{1}{3\cdot5}$; f^{la} ·7 × ·75, ·8 × 1·15 ; *br. lob* 1·8 × ·7–·8 ; br^{la} 2·0 × 1·05 ; *per* 1·95 × 1·05^{mm}.

Elatiuscula, badia. Caules 1–1½-pollicares, e caudice longe repente, ultra matricem horizontaliter patuli, ramosi, substratificati, ramis confertis iteratim proliferis monotropis.

Folia dense (ultra ½ lat.) imbricata, semicordato-ovato-oblonga, sublinguæformia, apice decurvo obtusata—raro subacuta rotundatave, margine antico late recurva, postico subrecte complicata ; lobulus magnus = folii $\frac{2}{3}$, vel (raro) dimidium fere folium æquans, planiusculus, semiovato-rhomboideus apiculato-acutus, minime foliolo proximo obvelatus sed ultra ejus orbem longe protensus ; cellulæ subparvulæ pellucidæ subconformes, pariete ad angulos et media latera insigniter incrassato.

Foliola dimidio folio subæquilonga late cuneato-orbiculata-reniformiave recurvo-convexa, ad basin profunde foveolata—nec longe canaliculata qualia in affinibus.

Flores dioici : ♀ terminales, innovatione proliferâ suffulti. Bracteæ foliis æquilongæ, erectæ, ad $\frac{3}{4}$ vel fere ad basin usque complicato-bifidæ, lobis lanceolatis acutis, superiore plus minus acuminulato, inferiore paulo breviore duplo angustiore longe tenui-acuminato ; bracteola imo longior, perianthium subsuperans, lanceolato-oblonga, apice angusto incurvulo brevissime (ad $\frac{1}{8}$) acute bifida, segmentis acuminulatis.

Perianthia subimmersa, cuneato-pyriformia, compressula retusa subrostellata, antice depressa obscure carinulata, postice alte bicarinata (carinis subapproximatis), angulis omnibus rugulosis.

Archi-L. recurvans, S., priori e foliorum margine antico recurvo affinis, tenerior, colore clariore, est ; differt etiam foliis laxe imbricatis, lobulo majore, cellulis submajoribus ; sed præcipue bracteola multo minore apice lato solum emarginato, et perianthio emerso.

From the base of the fold, which is the lowest point of the leaf, the

base (or insertion) of the lobe and lobule is along two nearly contiguous lines parallel to the axis of the stem, on whose surface they ascend to nearly an equal height, the lobe very slightly higher than the lobule.

4. ARCHI-LEJEUNEA RECURVANS, Spruce.

Hab. Per fl. *Negro* totum ad arbuscularum ramulos foliaque, præcipue in sylvis "caatingas" circa *S. Gabriel* et *S. Carlos.*

F 1·4 × ·9; *lob* ·7 × ·4; *c* $\frac{1}{30}$; f^{la} ·6 × ·7; *br. lob* 1·5 × ·7; br^{la} 1·2 × ·6; *per* 1·8 × ·85^{mm}.

Pallide rufa. Caudices longe repentes caules subramosos sæpe prolifero-innovatos horizontaliter ultra matricem patulos stratificatosque proferentes.

Folia laxe imbricata, patula, sicca subtortilia nec autem decurvo-secunda nec convolutiva, tenuia pellucida, semicordato-oblonga ovatove-oblonga, obtusa vel rotundata, a basi ad medium usque complicata, biloba, margine ad lobuli apicem vix (vel non) subsinuata, margine antico toto late recurva; lobulus magnus = folii $\frac{1}{2}$, ovato-rhomboideus, inflatus, et vel totus involutus vel ad plicam ventricosus margine tamen subplanus, apice longiusculo acutus vel sæpissime incurvo-apiculatus; cellulæ mediocres subæquilateræ pellucidæ, margine lato subopaco cinctæ, fere vacuæ, inferiores sensim multo majores pellucidioresque.

Foliola lobos vix dimidios velantia, foliis duplo et ultra breviora, subcontigua, rarius subimbricata, reniformi-orbiculata (sed e margine toto recurvo subrotunda videntur) perpaulo latiora quam longa, basi excavato-amplexantia minime autem cordata.

Flores dioici: ♀ terminales, innovatione (sæpe monotropo-innovando-proliferâ) suffulti. Bracteæ foliis perpaulo longiores profunde complicato-bilobæ, lobo oblique ovali acuto obtusove, lobulo 3-plo minore lanceolato subacuminato; bracteola obovata emarginata, sinu apicibusque subacutis, margine repando.

Perianthia emersa, pyriformi-oblonga retusula brevi-rostellata, compressula, antice depressa—raro apicem versus carinulata—postice acute bicarinata, carinis omnibus subalato-asperulis = pellucida, cellulis vix elongatis conflata.

A *L. unciloba* Lindenb. certe distincta, præcipue foliis longioribus laxioribus pellucidioribus, margine supero recurvo-subsquarrosis, siccando subsquarrosis subtortilibus, lobulo duplo fere majore inflato; bracteola solum emarginata; demum perianthii carinis semper exasperatis.

5. ARCHI-LEJEUNEA CRISPISTIPULA, Spruce.

In arborum vetustarum cortice secus fluvios *Negro* et *Uaupés*, locis *Uanauaca, S. Gabriel, Panuré*, &c.; in M. *Campana* Andium Peruvianorum.

F ·8 × ·6; *lob* ·3 × ·13; *c* $\frac{1}{40}$; f^{la} ·4 × ·6; *br. lob* 1·15 × ·4; br^{la} ·0 × ·75; *per* 1·5 × 9^{mm}.

Tenella rufula laxe cæspitosa. Caules e caudice repente assurgentes parce et subfastigiatim ramosi, pollicares.

Folia late imbricata ovato-elliptica rotundata subplana, basi antica dilatata vix semicordata, integerrima subrepanda, paulo infra medium profunde abrupte sinuato-complicata, plica recta; lobulus $\frac{1}{2}$ folium vix æquans, subplanus lineari-rhomboideus v. fere rectangularis, margine interno cauli parallelo, apice acuto apiculatove; cellulæ parvulæ

æquilatero-hexagonæ, inferiores sensim submajores, marginales minores quadratæ.

Foliola subimbricata, foliis 2-plo breviora, lobulos haud perfecte obtegentia, reniformia, basi excavato-amplexantia, margine pulchre sinuato-crispa.

Flores dioici: ♀ terminales, innovatione semel prolifera suffulti. Bracteæ foliis dimidio longiores, ad $\frac{2}{3}$ bilobæ, lobis ligulato-oblongis obtusis rotundatisve, postico subduplo minore; bracteola obovato-oblonga retusa v. obtuse emarginata, margine subcrispula.

Perianthia foliis caulinis fere duplo longiora pyriformia subrostellata compressa, postice 3-carinulata, antice humilius 1–3-carinulata, carinis marginibusque sublævissimis.

Planta ♂ illi L. uncilobæ sat similis, minor tamen, tenerior, magis concinna. Andrœcia spicæformia, in summo (raro medio) ramo posita, elongata; bracteæ 8–12-jugæ, equitantes ventricosæ fere ad medium usque bilobæ, lobis obtusatis, postico paulo angustiore.

Sectio perianthii junioris supra medium facta, monstrat 3 carinas posticas subapproximatas, carinulâ inter has et marginales utrinque interposita; in facie anticâ carinulam unicam vel sæpius 3 minus distinctas; ex quibus, carinis marginalibus altioribus adjectis, perianthium 8–10-carinatum plicatumve evadit.

6. ARCHI-LEJEUNEA RUFA, Spruce.

Hab. Ad fl. Amazonum prope *Santarem* et *Obidos*, in cortice vivo.

F ·9 × 1·0; *lob* ·3 × ·25; *c* $\frac{1}{18}$–$\frac{1}{10}$; f^{la} ·55 × 1·0; *br* 1·25; br^{la} 1·25 × 1·2; *per* 1·3 × ·9^{mm}.

Mediocris rufescens effusa. Caules repentes, in plagulæ margine elongati, distanter breviter ramosi, cæteri pollicares apice assurgentes parce ramosi, unifariam innovati.

Folia confertissima subdecurva valde oblique semicordato-orbiculata, latiora quam longa, antice caulem late transeuntia, postice sinuato-complicata; lobulus = folii $\frac{1}{3}$ (ramorum = f. $\frac{1}{2}$) rhomboideus subplanus acuminulatus; cellulæ parvæ æquilateræ subpellucidæ inferiores submajores.

Foliola imbricata reniformia, fere duplo latiora quam longa, margine supero valde recurva.

Flores dioici: ♀ terminales, innovatione sæpe prolifera suffulti; folia subfloralia sensim majora, foliolisque rotundioribus; bracteæ propriæ foliis caulinis fere dimidio longiores obovato-oblongæ obtusæ, lobulo subbreviore acuto; bracteola æquilonga prælate cuneata, angulis rotundatis, integra.

Perianthia subemergentia f. caulino $\frac{1}{2}$ longiora cuneata, apice rotundato-truncato-subretusove tenui-rostellata, postice alte bicarinata, antice 1-carinulata, margine carinisque obsolete tuberculosis.—Perianthia sectione trapezoidea, facie anticâ medio elevata (carinulata), posticâ fere æquilata planissima, angulis omnibus peracutis.

A. L. unciloba differt foliis densissimis, latioribus quam longis; foliolis prælate reniformibus; bracteola apice truncato integra (nec bifida); demum perianthio breviore magis cuneato quam pyriformi.

7. ARCHI-LEJEUNEA LEPRIEURII, Mont.?

In G. L. et N. Syn. Hep. 319; *A. L. potamophila*, Spruce, Mst. (1854).

Hab. In arborum radicibus ramisque inundatis, ad fluminis Amazonum tributarios boreales, fl. *Negro* et *Casiquiari* præcipue, frequens. Planta revera riparia, imo interdum subfluitans. In sylvis palustribus Guianæ Gallicæ invenit LEPRIEUR.

F ·75 × ·5; *lob* ·15–·2; *c* $\frac{p1}{4\,0}$: f^{la} ·3 × ·35; *br* ·6; br^{la} ·6; *per* 1·2 × ·7^{mm}.

Elata sordide viridis, lurida sæpeque limo obruta, prostrata parum stratificata. Caules 2–4-pollicares, ramificatione crebra sed irregulari, raro pinnata vel subbipinnata.

Folia parum imbricata vel solum contigua, apice dissita, subplana, margine supero incurva, falcato-oblonga rotundata (forma fere eorum *Omaliæ trichomanoidis*), recte complicata; lobulus 5-plo brevior—interdum minutus, linearis subplanus, basi supra caulem incurrens, sinu in lobum sensim abiens; cellulæ parvulæ subconformes leptodermes, chlorophyllo copioso in annulum congesto subopacæ, medio pellucidæ.

Foliola dissita, foliis 2-plo minora, oblato-orbiculata-obovatave.

Flores monoici: ♀ in ramo sæpe brevi terminales, innovatione simplice proliferave suffulti. Bracteæ foliis minores, lobo anguste obovato rotundato, lobulo duplo breviore rhomboideo acuto, vel minore et oblique triangulari; bracteola obovato-oblonga rotundata integra.

Perianthia foliis duplo fere longiora, turbinata pyriformiave, apice depresso rostellata, subcompressa, 5-carinata—rarissime postice 3-carinata, antice leviter 2-carinulata, carinis omnibus subalatis asperulisque. Calyptra perianthium fere implens, ovalis, apice inæqualiter 3-valvis, infra medium incrassata cellulis 2–3-stratis constans. Pedicellus obscure noduloso-constrictus haud geniculatus. Capsula globosa; elateres prælongi valvulas fere æquantes.

Andrœcia polyphylla, medium ramum sæpe tenentia; bracteæ foliis consecutivæ, paulo breviores, subinæqualiter complicatæ, concavæ, apice bilobæ.

Obs. Cum *L. Leprieurii*, Mont. descriptione l. c. haud exacte convenit —quoad staturam nostratis majorem et folia falcata præcipue—eandem speciem tamen censeo.—Forsan etiam eadem est *L. parviflora*, Nees, a cl. Martio ad flumen Amazonum lecta, cui tamen adscripta sunt folia ovato-oblonga, lobulo minuto triangulari subnullove; cæterum nostra minime "parviflora" est, quum perianthia longitudinem $1\frac{1}{5}^{mm}$. attingunt.

L. clypeata, Schwein. (Virginia, Sullivant M. Allegh. no. 262) nostræ affinis, differt statura pusilla; colore albido-viridi; foliis minoribus semiovatis obscure subfalcatis; foliolis longioribus quam latis; bracteis ♂ paucijugis.

Specimina *L. Leprieurii* pulcherrima, ramis foliisque *Randiæ Ruizii* ex parte adnata, ex parte libera et in aquis fluitantia, ad fluv. *Casiquiari* legi; alia in ipsa terra inundata vigebant. Itaque in schedis meis hanc speciem primum appellavi *Lejeunea potamophila*, Mst.

8. ARCHI-LEJEUNEA FLORENTISSIMA, Spruce.

Hab. Ad fruticum ramos, in planitie Amazonica rarior (*Caripí* prope *Pará*); in Andium radicibus, præcipue secus rivulos, magis frequens (*Tarapoto*, etc.); etiam ad fl. *Ventanas* prope *Guayaquil*, in *Theobromate*).

F 1·0 × ·75, ·9 × ·65; *lob* ·4 × ·4; *c* $\frac{1}{10}$; *br* ·75; *br^da* ·6 × ·4; *per* 1·0 × ·6; *cal* ·6^mm.

Pusilla virescens, siccando flavida raro rufula. Caules e caudice repente suberecti 1–1½ pollices longi parce (raro symmetrice) bipinnati, ramique primarii iteratim innovando-proliferi, monotropi—raro primum dichotomi, florescentia maxima, ♂ vel ♀, in axilla, brachiis monotropis.

Folia subimbricata subplana, oblique oblonga ovatove-oblonga, sæpe falcata, obtusata rotundatave, medium versus sinuato-complicata; lobulus ⅓ folium fere æquans ovalis, in situ tam convoluto-inflatus ut fere linearis videatur, apice incurvo-bidentatus, dente supero longiore subulato, vel (in var.) muticus; cellulæ parvulæ pellucidæ, pariete ad angulos incrassato, chlorophyllo parco, inferiores sensim minores.

Foliola foliis plus duplo breviora dissita subrotunda, interdum retusula, plus minus recurva vel etiam squarrosa.

Flores monoici: ♀ creberrimi ad ramos innovando-proliferos terminales, quasi seriatim secundi. Bracteæ foliis subbreviores ligulato-oblongæ obtusæ, lobulo longe minore plano apice sublingulato, interdum ad dentem oblique triangularem acutum redacto; bracteola ovalis apice repandula.

Perianthia foliis subæquilonga, pyriformia subcompressa longe rostellata alte 5-carinata, carinis lævissimis vel rarissime rudimentarie alatis, anticâ humiliore, demum apice 4-fida, valvulis cuspidatis. Calyptra paulo brevior pyriformis, brevistipitata, tenuis (solum ipsa basi cellulis bistratis conflata), demum apice æqualiter trivalvis, longistyla. Pedicellus paulo exsertus, siccando obscure noduloso-constrictus haud geniculatus. Capsula globosa albida profunde 4-fida, valvis recurvis; elateres pauci longiusculi prope valvularum apicem, juxta margines præcipue, inserti.

Androecia vel terminalia vel ad caulem inferiorem lateralia, longispica julacea; bracteæ plurijugæ foliis caulinis sensim subminores, laxiusculæ complicato-turgidæ, breviter bifidæ, lobo superiore paulo majore.

Var. *α. monotropa*, caule apice simplice—rarissime furcato—flore ♀ magno terminali, cæteris floribus ♀ ad ramos innovando-monotropos, fl. ♂ in iisdem ramis terminalibus; foliorum lobulo apice bidentato—raro unidentato muticove.—Perianthia ad ramorum innovationes interdum tam numerosa quam foliorum juga, sæpe autem dimidio solum numero sunt.*.—*Tarapoto*, ad frutices secus rivulos; *Caripí*, prope Pará, ad arbores pomiferas.—

Var. *β. calliandra*, caule elatiore, apice furcato-cymoso, spica mascula maxima erecta in furca; foliis magis falcatis, lobulo apice in folium transeunte sine ullo dente terminali; perianthiis elongatis tenuipyriformibus.—Prope *Guayaquil*, ad fluvios *Ventanas* et *Daule*, in cortice.

* Capsula hujus var. in notulis meis sic descripta est. Valvulæ ¾ capsulæ semicircumferentiæ æquantes, lanceolatæ recurvulæ. Cellulæ strati exterioris tesselatæ, subrhombeæ, parietibus valvulæ marginibus subparallelis (nisi marginales minores subquadratæ) ad angulos columnis validis fulcitis, membrana secundaria valde sinuosa; cellulæ interiores subæquimagnæ crebre papillosæ, papillis plurimis brevibus, aliis autem in pilum fere elongatis. Elateres pauci, subapicales, valvulis subæquilongi, angusti, apice in annulum obtuse quadratum dilatati, helice simplice pertenui arctiuscule contorta. Sporæ magnæ tuberculosæ.

Obs. The Pará plant is the same as that from eastern Peru, and differs from that of Guayaquil, at the western foot of the Andes, in the leaf-lobule having an incurved tooth at the apex, and mostly an adjacent smaller tooth on the upper margin; and in the terminal (or axial) flower on the main stem being usually ♀, while the end of each branch bears a short ♂ spike, beyond the two, three, or more ♀ flowers that are set along the branch. But many plants of both forms are purely female, without any male spike.

Montagne's figure of his *L. Auberiana* in Sagra's *History of Cuba*, t. xix. f. 3, is not unlike our plant, but the leaves are said to be subrotund.

9. ARCHI-LEJEUNEA CRÜGERI, Lindenb.

In G. L. et N. Syn. Hep. 319.

Hab. Pará, in cortice (R. S. 1849). In insula *Trinidad* invenit CRÜGER.

F ·75×·55, *lob* ·15, *c* $\frac{1}{30}$; *f*^{la} ·2×·3, ·25×·35; *br* ·6; *br*^{la} ·6×·35; *per* 1·2×·57^{mm}.

Mediocris, rufescens; caules pollicares, parum ramosi.

Folia contigua vel subimbricata, late patula fere divergentia, oblique oblonga rotundata, basi antica subdilatata obscure semicordata, postica subsinuato-complicata; lobulus 5-plo brevior semiovato-rhombeus inflatus, sinu brevi, apice subobtuso plerumque incurvo occultoque; cellulæ subæquilateræ pellucidæ, annulo opaco cinctæ, mediæ $\frac{1}{30}^{mm}$.

Foliola 3–4-plo minora orbiculato-reniformia subsquarrose patentia.

Fl. monoici: ♀ in ramo homotropo-innovando terminales; bracteæ foliis minores ovales subacutæ fere ad basin usque bifidæ, lobulo parvo lineari v. sublanceolato; bracteola anguste oblonga retusula.

Perianthia alte emersa foliis subdimidio longiora, pyriformi-oblonga, duplo et ultra longiora quam lata, apice rotundato brevi-rostellata, antice carinulata, postice alte bicarinata, sublævissima.

Andrœcia caulem ramosve terminantia sæpe longispica; bracteæ majusculæ (foliis caulinis sensim minores) complicatæ, basi ventricosæ, apice breviter bilobæ, lobis obtusatis subinæqualibus.

L. florentissima habet lobulum dimidium fere folium æquantem; foliola duplo fere majora, tam longa quam lata, &c.

SUBGENUS VI.—*PTYCHO-LEJEUNEA.*

Plantæ ramicolæ erectæ pendulæve virides, siccando sæpe pulchre flavæ. Caules 3–4-pollicares, caudice brevi repente orti, laxe pinnati—raro ex parte dichotomi—laxifolii, arhizi; rami semel pluriesve innovati, 1—pluriflori, fœminei, innovatione apicali tamen sæpissime mascula; flagella nulla.

Folia subplana, siccando fere immutata, elongata, acuta apiceque sæpissime serrulata spinulosave, raro integerrima, parvilobulata; cellulæ mediocres parvulæve leptodermes chlorophyllosæ æquilateræ oblongæve.

Foliola foliis duplo breviora quadrato-rotunda subreniformiave, apice truncato retusove spinuloso v. integerrimo.

Flores monoici: ♀ ad speciem in ramis laterales—revera in innovationibus successivis terminales—raro dichotomiales. Bracteæ foliis minores angustiores, lobulo sublongiore, serrulatæ rarissime integerrimæ, bracteola integra v. breviter bifida.

Perianthia emersa oblonga obsolete rostellata compressula, 7–10-plicata, plicis obtusis (primum, ut videtur trigona): in speciebus orientalibus omnibus æqualiter symmetriceque 8- v. 10-plicata.
Amenta ♂ longispica, bracteis majusculis.

Hab. et *Distr.* Unicam speciem americanam cognitam prope Guayaquil ad *Theobromæ* truncos legi; cæteræ 6-vel plures insulis Malayanis, rarius Indiæ peninsula, incolæ.

Ptychanthus, Nees, Hep. Eur. III. p. 211; Syn. Hep. 289.

Mastigo-Lejeunea, ♀ *Thysano-Lejeunea*, differt caule firmiore *valde densifolio*, raro æqualiter pinnato, aliis ramis decurvis *flagellaribus;* foliis e margine late incurvo falcatis, *siccando caule circumvolutis;* cellulis minutulis insigniter *incrassatis;* foliolis plus minus cuneatis, *apice lato lunulatim exciso spinulosis; fl.* ♀ juxta caulis ramorumque apicem innovantem *confertis; bracteis foliis majoribus* serratis spinosisve; *perianthiis triquetro-prismaticis, carinis ala serrulata laciniatave auctis.*—Unica species Americana, *M. L. plicata* Spruce, perianthiis 6–8-plicatis ad *Ptycho-L.* accedit; ceteris caracteribus autem recedit: sc. ramificatione vaga, aliis ramis flagellaribus; foliis subfalcatis valde obtusis; dioicis; bracteis integerrimis.

Ptycho-Lejeunea Theobromæ. Autoica et paroica, elata dichotoma; rami spicis ♂ pinnulati. F. semicordato-ovata subobtusa, superiora subapiculata, lobulo minutissimo. Foliola duplo breviora subcordato-rotundo-quadrata, subtruncata, fere integerrima. Bracteæ fl. ♀ foliis plus duplo breviores, lobis acutis, raro apice 2–3-dentatis, inferiore longe minore. Per. oblonga obtuse 7–9-plicata.

† *Ptycho-Lejeunea sulcata* (*Ptychanthus sulcatus Nees*). Robusta pinnata; rami vel simplices (sæpeque apice masculi) vel dichotomi, flore ♀ sterili in furca, altero flore plerumque fertili ad quemque ramulum (ultra florem recte innovando-continuum). F. semicordato-ovato-oblonga ex subrotundo apice apiculato-acuta repandula integerrima, lobulo 4–5-plo breviore apice cum lobo acuminato-confluente. F^{la} duplo breviora orbiculari-reniformia, apice recurvulo subretusa repandulave. Br. ultra ½ complicato-bilobæ acutæ, lobulo lineari-rhomboideo. Per. a basi conicâ rectangulari-oblonga, subcompressa, 10-plicata.—*Java.*

† *Ptycho-Lejeunea Javanica* (*Ptychanthus Javanicus Nees*). Robusta pinnata; rami sæpe decurvi, in sicco subcircinati. F. semicordato-ovato-oblonga sensim acuminata acuta, apicem versus dentato-serrulata-spinulosave, toto margine leniter incurvo, lobulo minuto subinflato. F^{la} vix duplo minora subquadrato-orbiculata, basi subcordata, apice rotundo-truncato toto crebre spinuloso. Br. foliis subconformes, duplo fere breviores. Per. oblongo-turbinata, alte 10-carinulata.—*Java, Sumatra,* &c.

F 1·9 × 1·1, *lob* ·25, *c* $\frac{1}{40}$; f^{la} ·1·0 × 1·0; *br* 1·15; *per* 1·5 × ·85^{mm}.

Var. *Moluccensis* (=*Ptychanthus Molucccensis* Lac.) F. magis abrupte subacuminata; minus argute dentata, margine postico toto involuto (lobulo obsoleto) antico plano.—*Celebes,* &c.

Var. *intermedia* (*Ptychanthus intermedius* G.). F. solum acuta subserrulata, lobulata (idem ac in typo). F^{la} haud diversa, nisi pro apice solum denticulato.—*Java.*

† *Ptycho-Lejeunea semirepanda* (*Phragmicoma semirepanda* Nees). Robusta, ex p. dichotoma. F. suboblique semicordato-oblonga, acuta acuminulatave, superne dentata subspinosave (ramorum raro integerrima), lobulo 5-plo minore subovato inflato. F^la recurva, obovato-orbiculata, apice rotundato-truncato repanda vel denticulata. Flores ♀ dichotomiales; br. foliis sublongiores, acutæ, superne dentato-serratæ, lobo semiobovato, lobulo duplo breviore lineari. Per. obovato-oblonga compressa 8-plicata.—*Java*.

1. PTYCHO-LEJEUNEA THEOBROMÆ, Spruce.

Hab. ad fluvium *Ventanas* prope *Guayaquil*, in *Theobromæ* ramis.

F 1·8 × 1·3, 2·0 × 1·2 (*ramea*), *lob* ·2, *c* $\frac{1}{3\overline{6}}$; *f^la* ·7 × ·7; *br lob* 1·4 × ·7; *per* 1·6 × ·7; *br* ♂ ·6^mm.

Elata pallide viridis. Caules 3–4-pollicares suberecti iteratim dichotomi, ex parte spicis masculis pinnulati, steriles tamen laxe pinnati.

Folia subimbricata semicordato-ovata, basin versus latiora, superne sensim angustata, apice decurvo subobtusa, abrupte acuta vel superiora subapiculata, integerrima vel terminalia apice angulata, margine postico subincurva basique minutissime complicata, plica angusta folio 10-plo fere breviore; cellulæ parvulæ paulo elongatæ, omnes fere subconformes. Folia caulina breviora latioraque, ramea longiora.

Foliola dissita, vel superiora contigua, foliis 2½-plo breviora, rotundo-quadrata, basi subcordata, apice lato subtruncato repandula, a basi ad medium late sulcata.

Flores monoici: ♀ cymosi, nempe flore majore in caulis apice furcato terminali, floribus 1–3 utrinque ad innovationes oppositas (brachiatas) seriatim secundis. Bracteæ foliis plus duplo breviores, ad basin fere bilobæ, lobis linguæformi-lanceolatis plus minus acutis, raro apice 2–3-dentatis, inferiore longe minore angustioreque; bracteola ovata late emarginata vel breviter bifida, vel apice inæqualiter 3-dentata, complicata recurva.

Perianthia emersa viridia oblonga, sectione obtuse trigona, facie antica biplicata, lateralibus uni-biplicatis (unde perianthia 7–9-plicata evadunt) lævissima vix rostellata. Capsula globosa.

Andrœcia vel ramulis cauligenis constantia, longispica, vel ramos fœmineos terminantia; bracteæ 10-plurijugæ foliis triplo breviores equitantes complicato-bilobæ, parum inflatæ, lobulo postico angustiore. Ramuli interdum solum ex parte masculi; foliis inferioribus superioribusve caulinis conformibus. Raro flos fœmineus cum suo perianthio ramulum masculum terminat (florescentia paroica !).

L. florentissimæ S. subaffinis, triplo elatior est; folia foliolaque duplo majora, illa plerumque acuta, lobulo fere obsoleto, hæc subquadrata basique subcordata; perianthia (pro foliorum ratione) longe minora, oblonga (nec obovata,) *pluriplicata*. Andrœcia nunquam in caule terminalia speciosaque (ac in *L. florentissima*) videntur.

Cum *Ptychanthis* veris orientalibus habitu, ramificatione laxe pinnata textura, etc. bene convenit; a plerisque differt foliis foliolisque integerrimis (dum in *Pt. Javanica*, *Moluccensi*, etc. superne argute dentata sunt), quo caractere tamen *Pt. sulcatus* N. (e Java) æqualiter gaudet. Distinguenda hæc ultima foliis ex rotundo apice integris: foliolis lati-

oribus quam longis; bracteolis apice integris; perianthiis æqualiter 10-plicatis.

Flores ♀ *Ptychanthi Javanici* (æque ac *Pt. Moluccensis, intermediique*, quæ meræ prioris varietates videntur) in ramo brevi terminales, innovatione simplice mascula suffulti; *Pt. sulcati* autem in ramo primum furcato, dein alternatim innovando positi sunt, eodem fere modo ac in nostra *Ptycho-Lejeunea Theobromæ*.

SUBGENUS VII.—*MASTIGO-LEJEUNEA*, S.

Phragmicoma Syn. Hep. p.p.; *Thysananthus* N. Syn. Hep.

Elatinscula, late depresso-cæspitosa, apice virescens, inferne fulva fuscescensve. Caudex longe repens denudatus subramosus, sæpe multicaulis. Caules 1–3-pollicares validi assurgentes parum ramosi, vel subregulariter pinnati; alii rami apice florentes, innovando-prolongati; *alii* (pauci) *flagellares parvifolii decurvi radicantes*.

Folia mediocria (0·9–1·7^{mm} longa) conferta, humida distiche pectinatim patula, sicca pro more decurvo-convoluta, plus minus linguæformia, apice triangulari subacuta obtusave—raro rotundata vel apiculata, e margine toto postico (apice excepto) late incurvo subfalcata, sæpeque ad speciem ligulata; lobulus 3-4-plo brevior, lineari-rectangularis rhomboideusve subinflatus, margine plano integerrimo, apice acuto bidentellove; cellulæ plerumque parvæ minutulæve pariete incrassato utriculo sæpe constricto, subopacæ pellucidæve, inferiores majores magisque elongatæ.

Foliola foliis paulo (raro duplo) breviora, plerumque sublongiora quam lata, cuneata—basi angusta, apice dilatata—retusa vel late emarginata, integerrima vel apicem versus subdenticulata.

Flores monoici vel dioici: ♀ in caule ramove, apice iteratim monotrope innovato, terminales, ad speciem seriatim secundi, conferti—interdum creberrimi—rarissime dichotomiales. Bracteæ foliis subæquales, acutiores, integerrimæ vel serrulatæ, lobulo in aliis obcordato-bifidulo; bracteola angustior, emarginata vel breviter bifida.

Perianthia sæpius emersa, prismatico-triquetra, pyriformia obovatave, raro linearia, apice obtuse truncato rostellata, carinis vel nudis vel plus minus alatis, alâ in paucis latiuscula et laciniata vel ciliata, in unicâ duplicatâ; rarissime, plicis ad latera interpositis, 7–10-plicata-carinatave. Calyptra perianthio sat brevior rufa firmiuscula, clavato-pyriformis, ab apice ultra medium in valvulas 3, quarum duas sublatiores ovales, tertiam lanceolatam, dehiscens. Capsula subglobosa ultra dimidium quadrivalvis; valvulæ pallide rufæ recurvulæ facie interna papillosa et ab apice ad $\frac{1}{3}$ longit. elateribus tenuibus unispiris, apice dilatato-truncatis, sparse obsitæ. Pedicellus perianthio parum longior, ex ejusdem carina postica apice hiante extrusus, pallidus crassus, cellulis majusculis cylindricis collateralibus 21-seriatis (5 in diametro, axialibus uniseriatis) conflatus, siccando ad cellularum apices nodoso prominulus, ad internodos constrictus, quasi-articulatus, non autem geniculatus.

Obs. This subgenus divides naturally into two sections, viz.:—

1. TRIGONO-LEJEUNEA (= *Phragmicomæ* pars, "Syn. Hep.").
2. THYSANO-LEJEUNEA (= *Thysananthus* Lindenb. et "Syn. Hep.")

These agree in habit; in the almost constant presence of flagella; in the closely-set leaves, which are lingulate or ligulate—or at least appear so from a wide incurvation of their postical margin; in the cuneate, retuso-truncate or emarginate underleaves; in the repeatedly innovant ♀ stems or branches, and in the trigonous perianth. But in

Thysano-Lejeunea the leaves and underleaves are often finely denticulate or spinulose, and the triquetrous perianths spinose at the winged edges; whereas in

Trigono-Lejeunea, leaves, underleaves and perianths are quite entire.

These are the only tangible differences, except a slightly closer texture in *Thysano-Lejeunea*, and they can scarcely be regarded as more than sectional.

If, however, for the sake of retaining the name *Thysananthus*, which has already been applied by Lindenberg to one of these groups, we prefer to regard each group sub-generic, then our first section will stand as *Mastigo-Lejeunea* proper.

MASTIGO-LEJEUNEA normalis.
(sive *Trigono-Lejeunea*).

Hab. In arborum cortice, raro in saxis; planitiem diligit, neque in montes nisi humiliores ascendit.

Distr. Tres species in regione Amazonica et Subandina degunt, quarum una, *M. L. auriculata* (Wils.) in planitie solum ad fl. Amazonum ripas observavi; in Andium Peruviæ radicibus paulo frequentior est; per orbem terrarum autem in terris tropicis et subtropicis late distributa est, primum in America boreali extratropica a cl. DRUMMOND inventa; ex Indiæ orientalis diversis locis, sub nom. *Phragmicomæ versicoloris* Lehm. et Lg., lectam habemus. Cæteras duas species ad fl. *Negro* et *Orinoco* legi. Aliæ paucæ species in regione palæotropica crescunt, *e.g.*, *Phragmicoma humilis* Gottsche et *Phragm. ligulata* Kurz.

A. *Perianthia triquetra, faciebus lævibus vel raro carinulâ unâ alterâve percursis.*

1. *M. L. auriculata*, Monoica. Caules parce innovando-floriferi. F. abrupte acuta obtusave. Br. lobo subacuto, lobulo sæpius rotundato. Per. emersa pyriformia tenuirostria.

[*M. L. humilis* (G.) Dioica ? Caules subpinnati, ramis sæpe dichotomis. F. obtusata raro abrupte subacuta. Br. lobulo retuso subobcordatove. Per. emersa obovato-oblonga, alte triquetra vel (carinulâ posticolaterali adjectâ) asymmetrice 4-carinata.—*Java.*—A *M. L. auriculata* ægre separanda.]

2. *M. L. innovans.* Monoica. Caules creberrime innovandi, fl. ♀ confertissimis. F. apice semicirculari rotundata. Br. lobo rotundato, lobulo obcordato. Per immersa obcordato-obovata triquetra, faciebus lævibus.

[*M. L. ligulata* (N.; L. et Ldng.) Dioica. Caules inferne pinnati, superne

bis terve dichotomi, floribus ♀ in dichotomiis necnon ad brachia monotrope innovanda. F. ligulata obtusa vel abrupte subacuta, lobo sæpe subapiculato. Br. lobulo in apicem lanceolatum longe protracto. Per. tricarinata, lævia, facie antica unisulca.—*Pulo Penang. Banca.*]

B. *Per obscurius trigona, carinulis utraque facie adjectis* 7–10-*plicata.*

3. *M. L. plicatiflora.* Dioica. F. oblongo-linguæformia subfalcata obtusissima. Br. lobis angustis obtusis.

1. MASTIGO-LEJEUNEA AURICULATA, Wils., in Drummond's Mosses of S. S., No. 170. *Phragmicoma versicolor*, L. et L. Syn. Hep. 297.

Hab. In sylva Amazonica, prope *Santarem* et *Obidos*, super cortices, etiam prope *Pará* et in Andibus Peruvianis ad alt. 800^{m} usque.

F 1·05 × ·8, ·9 × ·7, *lob* ·3, *c* $\frac{1}{6\,5}$–$\frac{1}{4\,5}$; *fl*^{a} ·6 × ·5, ·75 × ·65 ; *br.* 1·0 ; *br*^{la} ·8 × ·6 ; *per* 1·5 × ·75^{mm}.

Late laxiuscule cæspitosa, inferne olivacea fuscave, surculorum apice tamen semper ascendentes, basin versus denudati et subfastigiatim ramosi, ramique superne prolifero-elongati. Adsunt etiam stolones pauci flagelliformes parvifolii apice decurvo radicantes.

Folia dense imbricata, ad Bazzaniæ instar distiche deflexa, suboblique semicordato-ovata (e margine infero toto incurvo subfalcata) apice triangulari subobtusa v. abrupte acuta, complicato-biloba, ad lobuli sinum sæpe crispata; lobulus 3-plo brevior linearis v. dimidiato-ovatus, apice brevi acuto sæpius obliquo, involutus v. fere explanatus; cellulæ superiores minutulæ, inferiores sensim majores, omnes subrhombeæ incrassatæ subopacæ.

Foliola foliis dimidio breviora late cuneato-oblonga, retusula, totâ longitudine insigniter canaliculata.

Flores monoici: ♀ secus ramorum apicem seriatim secundi—revera in ramo iteratim innovando-prolifero terminales. Bracteæ foliis subæquales, lobo ovali subacuto recurvulo, lobulo 2-plo breviore rhomboideo rotundato rarissime emarginato; bracteola obovato-oblonga emarginata carinata.

Perianthia folia plus minus superantia pyriformia triquetra tenui-rostellata, carinis lævissimis—rarissime alæ fragmentis asperulis—posticâ interdum duplicatâ. Calyptra obovata tenuis, perianthio satminor. Capsula globosa subdepressa.—Perianthia aliquando utraque facie carinulâ unâ alterâve aucta, de modo ut ad *L. plicatifloram* accedit species.

Andrœcia in rami primarii medio apiceve posita; bracteæ pro more plurijugæ laxiusculæ.

Specimina Drummondiana archetypa (Mosses of S. S. 170) a nostris haud discrepant nisi statura paulo minore et perianthiis brevioribus ultra bracteas vix emersis.

L. 248 hb. (Santarem) eadem est, in hac tamen lobulus margine supero sæpe angulato-2–3-crenulatus invenitur.

Var. *virens* (*Mastigo-L. virens*, Mst. hb. L. 502). In Andibus Peruvianis humilioribus sat frequens, vix supra 800^{m} alt. ascendens, locis Tarapoto, Tavalosos, Mt. Guayrapurina, etc.; necnon in palmæ trunco ad fluvium Guamá prope Pará.—Forma insignis, vix pro specie propria habenda, differt a typo: statura majore; foliis margine supero magis

incurvo-appressis, lobulo bidentulo; foliolis oblatis reniformibus; bracteārum lobulo subrotundo emarginato; perianthii carinis fere constanter alatis—ala 2–5 cellulas lata.—Folia inferiora plerumque rotundata, superiora apice triangulari obtusata rarius abrupte subacuta; lobulus sæpe semiovalis, utrinque sensim angustata, sinu prælato obliquo, plicâ ultra lobulum verum transeunte. Foliola sæpe late obcordato-cuneata—vel fere obcordato-reniformia, alis late recurvis.

Inter formas hujusce speciei probabiliter enumeranda est *Phragmicoma teretiuscula*, L. et G., Syn. Hep. 745 (Gottsche, Mex. Leverm. 175) quæ vix differt nisi foliis sublongioribus. *Phr. iuliformis* Nees Syn. Hep. 298, plane valde affinis est, si non eadem.

Phragmicoma repleta, Tayl.! Mst. (Madras: Wight in hb. Hook.—specimina ab ipso Lindenbergio ad *Phr. versicolorem* L. et G. redacta) eadem certe videtur ac *Phr. humilis*, Gotts.! (Java: hb. Lindberg). Hæc autem vix differt a *Lejeunea auriculata* nisi statura minore, lobulo foliorum incurvo-apiculato, perianthiisque prælte triquetris.

In omnibus formis, jam supra memoratis, caules vidimus ad ramos novellos pulchre virides, basin versus plus minus fuscescentes.

2. MASTIGO-LEJEUNEA INNOVANS, SPRUCE.

Hab. Ad arborum truncos propre *Panuré* fl. *Uaupés*.

F 1·25 × ·9; *lob* ·5 × ·25; *c* $\frac{1}{5}\frac{1}{5}$; f^{la} ·75 × ·75; *br. lob* 1·6 × ·75, *lobul* 1·1 × ·7; br_{la} 1·3 × ·6; *per* 1·25 × ·75^{mm}.

Elatiuscula badia procumbens. Caules 2-pollicares implexi vage ramosi, ramique iteratim (ad 10ies) innovando-proliferi, innovationibus mono- (raro hetero-)tropis pauci-confertifoliis 2–3-floris; alii rami apice attenuato decurvo radicantes.

Folia densa, patula, concava siccando haud arcte (vel vix) convolutiva, falcata late semicordato-ovato-oblonga insigniter rotundata—apice semicirculari, basi subdecurrentia, margine postico late sinuato-incurva, complicato-biloba (plica ultra lobum protracta); lobulus folio $2\frac{1}{2}$-plo brevior, semiovato-rhomboideus-rectangularisve acutus, medio margine unidentatus, solum ad plicam inflatus, cæterum planus appressus; cellulæ minutulæ subrhombeæ, incrassatæ, pulchre pellucidæ, inferiores sensim majores.

Foliola imbricata, $\frac{1}{2}$ folium superantia, late rotundo-cuneata-obovatave, retusula, repandula integerrima, a basi ultra medium canaliculata.

Flores monoici: ♀ creberrimi, seriatim secundi, terminales,—ex innovationibus quasi-laterales. Bracteæ foliis majores recurvo-falcatæ, ad $\frac{2}{3}$–$\frac{3}{4}$ bilobæ; lobus oblique obovato-ovalis rotundatus incurvo-canaliculatus; lobulus fere æquilatus, dimidio brevior, subrotundus v. late oblongus, subrevolutus, apice lato insigniter obcordato-emarginatus: bracteola obovato-lanceolata oblongave, duplo longior quam lata, retusula, marginibus plus minus revolutis.

Perianthia subimmersa obovata triquetra, apice subobcordato brevissime rostellata, carinis valde compressis exalatis, raro obsolete alato-repandis. Capsula globosa 4-partita vix exserta.

Amenta ♂ ramulis propriis constantia, folio caulino plus minus longiora, plerumque 2 v. 3 ad cujusque innovationis primariæ basin fasciculata, polyphylla, julacea, decurva; bracteæ parvæ usque ad 20-jugæ.

The stems and branches sometimes innovate as often as ten times, each

innovation diverging slightly from the direction of the one preceding. In reality the innovations are double that number—or more—for each main innovation has 2 (rarely 3) perianths at the apex, so near as often to touch each other; yet each upper perianth terminates an additional innovation, so short that it has only a single pair of leaves below the flower.

The calyptra in this and other allied species is rufous, clavato-pyriform, of firmish substance, and splits for the emission of the capsule regularly into 3 valves, whereof two are broader and oval, the third lanceolate; they are all obtuse, and are separate to or below the middle of the calyptra. This plainly indicates that the calyptra originates in the union of a pair of leaves, with their intervening foliole, precisely as the perianth does.

3. MASTIGO-LEJEUNEA PLICATIFLORA, Spruce.

Hab. In arborum cortice ramulisque, in sylvis fl. *Negro* humilioribus *præcipue* (*San Carlos*) etiam ad fl. *Orinoco* cataractas (*Maypures*), rarius ad saxa prope *Tarapoto* Andium Peruviæ.

F 1·45 × ·85, 1·2 × 8, 1·0 × ·6; *lob* ·3 × ·15; *c* $\frac{1}{15}$—$\frac{1}{40}$; f^{la} ·6 × ·65, ·6 × ·75, ·4 × ·45; *br* 1·5; br^{ta} 1·4 × 1·0; *per* 1·5 × ·9, 1·5 × ·75mm.

Late prostrato-cæspitosa, vix stratificata, rufo- vel fusco-badia, apice virescens. Caules, e caudice longe repente subdiviso, 2–3-pollicares tenuiusculi horizontales pendulive vage ramosi, ramis pro more brevibus sæpe prolifero-elongatis, raro dichotomis, interdum assurgentibus, aliis deflexis, subaphyllis microphyllisve, radicantibus.

Folia plus minus imbricata, angulo recto divergentia, subdeflexa, siccando convoluta raro patentia e marginis postici inflexione subfalcata, oblongo-ovatove-linguæformia, obtusa rotundatave, subrecte complicato-biloba; lobulus 4-plo brevior ovato-rhomboideus subacutus, ad plicam inflatus, cæterum planus appressus, margine interno (sinûs) cauli parallelo; cellulæ parvulæ subopacæ subelongatæ rhombeo-hexagonæ pachydermes, subbasales mediæ laxiores pellucidioresque.

Foliola subduplo breviora, imbricata, subrotunda, v. cuneato-rotunda, raro reniformia, apice reflexo retusa obcordatave, margine basi recurva, a basi ad $\frac{1}{2}$ alt. canaliculato-impressa.

Flores dioici: ♀ terminales, raro e dichotomia, innovatione plerumque unilaterali prolifera suffulti. Bracteæ foliis longiores, ultra $\frac{2}{3}$ bifidæ, lobo oblongo-lanceolato-ligulatove obtuso, lobulo subconformi duplo breviore; bracteola magna late oblonga retusa emarginatave.

Perianthia vix emergentia, pyriformia oblongave, rotundato-truncata obsolete rostellata subcompressa, utraque facie 2–3-carinata, carinis marginibusque sublævibus raro rudimentarie alato-rugosis.

Andrœcia medio caule ramove posita; bracteæ plurijugæ foliis consecutiva paulo breviores confertioresque, subæqualiter bilobæ basi turgidæ, diandræ.

Perianthia normaliter apicem versus 10-plicata, plicâ tamen unâ alterâve laterali aliquando obsoletâ, 7–9-plicata fiunt. E plica media postica cæteris subvalidiore, perianthium in sectione trigonum evadit; ex quo, necnon e foliis linguæformibus opacis, lobulo rhomboideo margine plano appresso; foliolis retusis, basi brevi insertis (unde facile solutis) affinitatem aliquam cum *Thysano-Lejeunea* patet, majorem autem cum *Mastigo-Lejeunea*, e.g. cum *M. L. auriculata* (Wils.).

Ad S. Carlos del Rio Negro adest var. *tenuissima*, elongata, subdicho-

toma, foliis oblique ovalibus plerisque rotundatis, foliolis late emarginatis repandulis.

Phragmicoma ligulata, Kurz ! (in ins. *Banca* a Kurz lecta) valde affinis est, foliolaque fere exacte conformia. Folia autem duplo longiora quam lata, ligulata, interdum subacuta; bracteola angustior carinato-complicata eroso-repandula. Perianthia nondum vidi, sec. cl. Lindenberg autem tricarinata sunt, cæterum eplicata.

SUBGENUS VII.*—*THYSANO-LEJEUNEA.*

Sive *Mastigo-Lejeunea*, § *Thysano-Lejeunea* = *Thysananthus*, Lindenb. Sp. Hep. = *Bryopteris*, Sp. Nees.

Hab. Ad arborum humiliorum præcipue truncos ramosque in terris calidis æquinoctialibus.

Distr. Th. L. amazonica, S., per totam planitiem Amazonicam fere trivialis, habitationum viciniam diligit, in montes nusquam ascendit, neque ad Andium pedem occidentalem visa fuit. *Th. L. dissoptera*, Spruce (*Thysananthus comosus*, Syn. Hep. quoad stirpem Americanam) solum e Guiana anglica possidemus. Tertiam speciem, *Th. L. pterobryoides*, S., haud sine dubio huc relatam, quum plantam masculam solum vidi, ad Andium pedem orientalem inveni. Quarta species, e descriptione videretur, *Lejeunea cognata*, Nees, e Brasilia allata, mihi adhuc ignota.—In regionibus palæotropicis multo magis numerosæ videntur species, quarum ipse examinavi *Thysananthus comosus*, Lindenb. ! (typus), *Th. spathulistipus*, Ldng., *convolutus* Ldng., *reniloba*, G.: omnes insulis Malayanis incolas; aliæque paucæ orientales enumerantur.—Tres species Novo-Zelandicas, a cel. Taylor ad *Thysananthum* adscriptas, e descriptionibus vix congeneres censerem.

Obs. This group has few representatives in equatorial America, but one species, *Th. L. amazonica*, is perhaps more frequent than any other *Lejeunea* on the Amazon and its tributaries, where it occurs as a weed on old Calabash and other trees, planted near dwellings. I thought, at first it might be a form of *Thysananthus comosus*, Lindenb., but having now examined in Hooker's herbarium the original specimens on which that species was founded, I find it quite distinct. Lindenberg's "species," indeed, combines the characters of two distinct species—the one American, from Guiana, the other Asiatic, from Pulo Penang and New Guinea. A careful study of Hooker's specimens has convinced me that the eastern plant, *Th. L. comosa*, Ldng. *vera*, is a different species from the western, which I call *Th. L. dissoptera*, n. sp. (See below, after *Th. L. amazonica*.)

The eastern tropics would seem far richer in species of *Thysano-Lejeunea* than the western. All the oriental agree with the American species in habit and texture; in the form and armature of the perianth; the crowded leaves and flowers; the very acute and usually toothed leaf-points; and the cuneate emarginato-truncate under-leaves, usually toothed upwards. *Th. L. spathulistipa* differs from all the American species in having the ♀ branches usually dichotomous.

A. *Caules elati, pro more laxe inæqualiter pinnati. Folia foliolaque conferta, apice minute serrulata vel integerrima; cellulæ subplanæ.*

1. *Thysano-Lejeunea amazonica*—Monoica. F. ovato-linguæformia, pungenti-acuta subapiculatave. Foliola duplo breviora, late cuneato-obovata emarginato-truncata; angulis subapiculatis, margine supero subserrato. Br. lobo acuminulato subserrato, lobulo ligulato acuto apice denticulato; bracteola superne serrulata, breviter bifida, segmentis acuminulatis. Per. sublineari-prismatica, carinis apicem subalatis denticulatisque.
2. *Th. L. dissoptera*. Dioica? A priore differt foliis ovali-rotundis abrupte apiculatis; foliolis dimidio majoribus apice sæpius rotundatis; br. spinulosis, lobulo subrotundo apice 2–3-fido; perianthio obovato, *carinis latiuscule bialatis*, alis duplo laciniatis.

[*Th. L. comosa*, Ldng. Dioica? A prioribus duabus differt foliis densissimis ovatis, apice cucullato abrupte apiculatis, lobulo minuto; foliolis majoribus oblongo-cuneatis (apice ac in *Th. L. amazonica*); br. lobulo oblongo-rotundo subbifido, toto margine laciniato-serrato; bracteola integra (nec bifida) margine subduplo inciso-serrata; per. *carinis longiciliatis.—Nova Guinea. Pulo Penang.*]

[*Th. L. convoluta*, Ldng. Dioica, robusta fuscidula, fastigiatim ramosa. F. conferta subtransversa, arcte incumbentia vel subpatula, semicordato-ovata ex rotundo apice minute apiculata, integerrima, cymbiformi-concava, toto margine inflexo; lobulus 5–6-plo brevior planus semiovatus subacutus; cellulæ parvulæ obscuræ, utriculo lineari sinuoso. Fla paulo breviora, plus duplo angustiora angulato-denticulata.—*Java.*]

[*Th. L. reniloba*, Gottsch.? sub *Phragmicoma*. Dioica, majuscula fusco-badia pinnata et subbipinnata, ramis omnibus fere apice decurvo flaggellaribus. F. conferta distiche divergentia semicordato-ovata apiculata, integerrima apiceve angulato-denticulata, toto margine antico valide recurvo, postico dimidio inferiore late incurvo, superiore late recurvulo (unde folia insigniter torta videntur); lobulus 5-plo brevior, subplanus, late semiovatus, apice minute bidenticulatus; cellulæ parvulæ oblongæ, basales multo longiores laxioresque. Foliola sublatiora quam longa, cuneato-spathulata, apice lato rotundato, retusulo excisulove, minute denticulata.—*Banca* (KURZ !). Cum nomine Gottschei male congruit.]

[*Th. L. spathulistipa*, Ldng. Dioica, majuscula, flavida, dichotome ramosa et flabellata, rarius subpinnata. Folia imbricata patula semicordato-ovato-oblonga peracuta acuminulatave, apicem versus dentato-serrulata, e margine postico late incurvo, antico recurvulo, falcata; lobulus 4-plo brevior linearis acutus bis inflexus; cellulæ parvulæ elongatæ. Foliola cuneato-obovata, e margine basin versus recurvo ad speciem spathulata, apice exciso-truncato dentato-spinulosa. Br. foliis longiores, bipartitæ, lobo grosse serrato, lobulo laciniato; bracteola obovata-oblonga apice late emarginato spinoso-serrata. Per. obovato-cuneata triquetra retusa brevirostris, carinis supra medium crista laciniato-ciliata auctis.—*Ceram. Java. Mauritius.*]

B. *Caules humiles plumæformi-pinnati. F. foliolaque toto fere margine argute serrulata; cellulæ papuloso-prominulæ.*

3. *Th. L. pterobryoides*. Dioica. Caudex validus longe repens, caules plures stipitatos frondiformes edens.

1. THYSANO-LEJEUNEA AMAZONICA, Spruce.

Hab. Per totam planitiem Amazonicam, in sylvis humilioribus præcipue recentioribus, ad fruticum ramulos raro etiam ad truncos.

F 1·7 × 1·0, 1·5 × ·8, 1·35 × ·85; *lob* ·35 × ·15; *c* $\frac{1}{5}$; f^{la} ·75 × ·7, ·7 × ·8; *br* 1·4; br^{la} 1·4 × ·8; *per* 2·0 × ·7^{mm}.

Elatiuscula, fuscidula, apice virescens, cæspitoso-stratificata. Caudex longe repens ramosus denudatus. Caules 1–3 pollicares assurgentes rigidiusculi nigrescentes, pinnatim subramosi, raro symmetrice plumæformi-pinnati; alii rami devexi microphylli radicantes.

Folia confertissima pectinatim patula convexa, siccando caule arcte circumvoluta, suboblique ovato-oblonga linguæformia e margine postico valide sinuato-incurvo subfalcata, pungenti-acuta sæpe subapiculata integerrima, v. superiora apice angulata v. etiam subserrulata; lobulus 4-plo brevior linearis v. anguste rectangularis apice bidentellus, e folii margine incurvo sæpe absconditus, plica longe ultra lobuli apicem transeunte; cellulæ minutulæ pellucidæ rhomboideæ v. rhombeo-hexagonæ insigniter incrassatæ, nucleo angusto sinuato, inferiores sensim multo majores.

Foliola imbricata dimidium folium æquantia late cuneato-obovata, e margine subbasilari recurvo spatulata, a basi fere ad medium impresso-canaliculata, apice lato emarginato-truncata, sinu lunulato subacutove subintegerrimo, angulis apiculato-acutis, margine apices versus repando v. obtuse subserrato.

Flores monoici: ♀ in caulis ramive apice monotrope innovando 2–3-ni conferti, foliis solum unijugis inter duos flores consecutivos interpositis; innovatione terminali sæpe elongata foliosa apice iterum innovando-florifera. Bracteæ foliis subæquales, complicato-bilobæ, lobo forma foliorum acuminulato subserrato, lobulo dimidio v. duplo breviore ligulato acuto apice denticulato; bracteola æquilonga longe cuneato-obovata carinata breviter acute bifida, segmentis acuminulatis, supra medium serrulata.

Perianthia subemersa 2–3-plo longiora quam lata, a basi brevi cuneatâ triquetro-prismatica—raro subobovata, facie antica convexa medio unisulca, margine valde devexa, carinis acutis apicem versus perangustе alatis denticulatisque vel spinulosis, dentibus dissitis subulatis v. brevioribus haud raro obsoletis, apice rotundato-truncato minute rostellata.

Andrœcia ramulos terminantia; bracteæ sub 6-jugæ laxiusculæ foliis subbreviores, lobulo majori involuto.

Thysananthus comosus Lindenb.! Syn. Hep., (Guiana, hb. Hook.—exempla typica—*Thysano-Lej. dissoptera* Spruce) certe distincta videtur, colore rufo-badio; caulibus elatioribus sæpe bipinnatis; *foliis ovali-rotundis abrupte apiculatis;* foliolis dimidio majoribus, eadem forma ac *Thysano-L. amazonicæ, apice tamen rotundatis* vel obscure retusulis—nec insigniter lateque exciso-emarginatis; bracteis magis spinulosis, lobulo subrotundo apice 2–3-fido; bracteola breviter bifida, segmentis acuminulatis, spinoso-serrulata; perianthiis obovatis, ab apice ultra medium latiuscule trialatis, *alis bilamellatis, lamellis bis laciniatis.*

Thysananthus comosus Lindenb.! Syn. Hep. l.c. (Nova Guinea, hb. Hook. etc.—alia exempla typica) tertia species erit. Folia habet omnium densissima, oblique ovata, *apice decurvo-cucullato* abrupte apiculata subdenticulataque; *lobulum minutum* folio 6-plo breviorem; *foliola dimidio majora oblongo-cuneata*, apice exciso denticulata; *bractearum lobulum oblongo-rotundum apice subbifidum*, toto margine laciniato-serrato; bracteolam foliolis parum diversiformem (nec bifidam) margine autem subduplo inciso-serrato; *perianthia* (juvenilia), apice carinisque crebre *longiciliata.*

Obs. The composite species "comosus" was founded by Lindenberg on the two forms above described, and his description in Syn. Hepat. combines the characters of both. I have examined the type-specimens in herb. Hook., named by Lindenberg himself, and find them abundantly distinct.—If the oriental plant is to be regarded the true "comosus," then the Guiana plant may bear the name *Thysano-Lejeunea dissoptera* I have given it above.

2. THYSANO-LEJEUNEA DISSOPTERA, Spruce.

Thysananthus comosus Lindng. Syn. Hep. 288, pro p. "Guiana": hb. HOOKER! (Ipse nusquam legi).

F 1·3×1·1; *lob* ·35, *c* $\frac{1}{40}$; *f*^{ta} ·8×·85; *br* 1·4; *per* 1·5×1·0; *alæ* ·25^{mm} *latæ*.

Elata procumbens. Caules 3-pollicares inæqualiter pinnati v. bipinnati, ramis nonnullis (inferioribus præcipue) devexis microphyllis radicantibus.

Folia rufo-badia conferta decurva oblique ovali-rotunda abrupte apiculato-acuta, margine postico late incurva (unde subligulata videantur) nec raro subdenticulata; lobulus 4-plo brevior angustus semiovato-linearis, ad apicem usque cum lobo confluens, vel dente brevi prominens, inflexus involutusve; cellulæ parvulæ iis *L. amazonicæ* conformes.

Foliola late imbricata foliis dimidio breviora, prælate cuneata, *paulo latiora quam longa*, e marginis inferioris recurvatione subspathulata, apice rotundato raro obscure retusulo denticulata, a basi ultra medium impresso-canaliculata.

Flores dioici: ♀ rari, terminales, innovatione simplice v. parce proliferâ suffulti. Bracteæ foliis perpaulo longiores suberectæ; lobo longe oblique ovato subacuminulato apice margineque postico subspinuloso; lobulo vix ad lobi $\frac{1}{5}$ alt. usque cum eodem connato dein libero, lobo duplo breviore subrotundo *apice bifido* (raro 3-fido), segmentis acutis, margine toto spinuloso; bracteola æquilonga ovali-cuneata, breviter bifida, segmentis acuminulatis, spinoso-serrulata.

Perianthia apice vix subemersa, *obovata*, trigona, ex apice subemarginato brevi-rostellata, angulis ab apice ultra medium latiuscule alatis, *alis duplicatis*, utrâque bis laciniatâ, lacinulis hamatis; facie antica interdum obscure obtuse biplicata, lateralibus 1-plicata; plicâ unâ alterâve raro apice cristuliferâ. Calyptra paulo brevior angustiorque ovali-pyriformis demum apice 3-fida.

† THYSANO-LEJEUNEA COMOSA (Lindng.).

Thysananthus comosus, Lindng.! Syn. Hep., p. parte.

Hab. Pulo-Penang (hb. HOOKER!). *Nova Guinea* (hb. LINDBERG!).

F 1·5×1·0, *lob* ·25; *c* $\frac{1}{60}$–$\frac{1}{30}$; *f*^{ta} 1·1×·7; *br* 2·0^{mm}.

Robusta rufo-badia. Caules bipollicares inferne fastigiatim divisi, dein pinnati, aliis pinnis decurvis microphyllis apice radicelliferis.

Folia arctissime imbricata, concava, in sicco julacco-convolutiva, oblique ovata, apice decurvo-cucullato abrupte apiculato-acuta sæpeque subdenticulata, margine postico involuto basi minute complicato; lobulus

folio 6-plo brevior, subrotundus vel sæpius semiovatus, integerrimus, truncatus vel confluens; cellulæ valde obscuræ, mediæ elongatæ (utriculo collapso), folii mediam basin versus majores discoloresque.

Foliola appresso-imbricata, foliis paulo minora, oblongo-cuneata, apice retuso excisove subdenticulata, tota longitudine profunde sulcata, margine laterali tam reflexo ut spathulata videantur.

Flores dioici: ♀ ex innovationibus subrecte continuis seriatim secundi. Bracteæ foliis majores, ad $\frac{3}{4}$ bifidæ; lobo late semiovato subacuminato superne serrulato; lobulo dimidio breviore, perpaulo angustiore, oblongo-rotundo, apice sæpe subbifido, toto margine laciniato-serrato; bracteola foliolis paulo longior, magis sulcata undulataque, a basi fere subduplo-inciso-serrata.

Perianthia (valde juvenilia) triquetra, apice carinisque ciliis longis fimbriata.

3. THYSANO-LEJEUNEA PTEROBRYOIDES, Spruce.

Ad fluvium *Pastasa*, alt. 400^{mm}, in arborum ramulis : planta mascula sola, rara.

F 1·3 × ·7, *lob* ·2, *c* $\frac{1}{6}$; f^{la} ·55 × ·6; *br* ♂ ·6 × ·5^{mm}.

Caudex longe repens validus nigrescens parvifolius, demum fere denudatus nisi pro radicellis hypogenis. Caudex $\frac{1}{4}$–1-pollicares assurgentes, arcte plumæformi-pinnati, frondem ovatam sistentes, pinnis alternis confertiusculis raro pinnulatis.

Folia pallide viridia, ad $\frac{1}{3}$ imbricata, plana, siccando immutata, suboblique semicordato-oblonga abrupte subacuta, apicem versus, vel (ramea præcipue) toto fere ambitu, inæqualiter serrulata et submuriculata, margine postico toto incurvula basique involuta; lobulus minutus, folio 7-plo brevior ad pliculam inflatam redactus, vel in foliis rameis magis distinctus et semiovatus; cellulæ minutulæ subopacæ, guttulatæ, papuloso-prominulæ, marginales conicæ, subbasales duplo longiores pellucidæ.

Foliola imbricata, foliis plus duplo breviora, late cuneata, basi subcordata, apice lato truncato profunde emarginata, sinu plerumque triangulari, angulis acutis, margine toto fere minute vero argute et subduplicato-dentato-serrulata, alis recurvulis.

Flores dioici: ♀ (haud visi).

Amenta ♂ rara, ramos normales terminantia (nec ramulo proprio constantia). Bracteæ sub 5-jugæ, foliis caulinis duplo et ultra minores, equitantes parum inflatæ complicato-bilobæ, lobis rhomboideis obtusis serrulatis, subæquilongis, inferiore duplo angustiore; antheridia binata stipitata; bracteolæ anguste oblongæ retuso-truncatæ apice serrulatæ.

Planta elegantula tenella, dubiæ affinitatis, *Thysano-L. amazonicæ* certe similis, habitu, foliolis cuneatis emarginato-truncatis, cellulis minutis elongatis, pariete (inferiorum præcipue) incrassato, etc. ; differt hæc foliis magis confertis, terminalibus solis apice subdenticulatis, lobulo longiore rhomboideo, floribus monoicis, etc. In plantis *L. amazonicæ* sterilibus adest frequenter eadem ramificatio plumæformis-pinnata ac in nostra, minus densa tamen, aliisque ramis flagellaribus.—*Thysananthus spathulistipus* Lindenb. forsan magis affinis erit, caulibus sterilibus flabellato-pinnatis, foliis apicem versus dentato-serrulatis, foliolis apice insigniter

excisis dentato-spinulosis, conveniens ; cæteris caracteribus autem diversus. A cæteris *Thysano-Lejeuneis* omnibus differt nostra foliis in sicco planissimis—nullo modo cauli convolutivis.

Dendro-Lejeunea (= *Bryopteris fruticosa* L. et G.) affinis est florescentia dioica, ramificatione pinnata, flagellorum absentia, spicis masculis terminalibus, foliorum foliolorumque forma, directione serraturisque, necnon cellulis minutis; differt caule elongato multo laxius pinnato, foliis foliolisque apice solo serratis, illis vittatis, his oblongo-rotundis, cellulis (vittæ exceptis) imo minutioribus.

Ptychanthus javanicus, Nees, nostræ subsimilis quoad caules pinnatos et folia apicem versus argute dentato-serrulata, lobulo minuto; distincta est foliolis apicem rotundato-truncato solo crebre spinulosis, cæterisque caracteribus.

Cum *Bryo-Lejeunea* convenit nostra ramificatione crebra pinnata, foliolis toto fere margine argute dentatis, etc.; differt *ramis alternis*, spicis ♂ terminalibus, foliis siccando planis nec convolutivis, etc.—Denique, dum fructificatio ignota remanebit, melius (meo judice) inter *Thysano-Lejeuneas* militaverit.

SUBGENUS VIII.—*DENDRO-LEJEUNEA*, S.

Subgenus, in unica specie, *Bryopteris fruticosa*, L. et G., ins. Javæ incola, fundatum, caule elato bipinnato, cæt., *Bryo-Lejeuneæ* fere conforme, differt ramis ♀ innovando-proliferis, sæpe dichotomis (nec brevibus simplicissimis); foliis tota fere longitudine vittatis (e cellulis mediis elongatis, cæteris cellulis minutissimis); perianthiis obcordato-oblongis triquetris margine cristatis, utraque facie 1–2-carinulatis.—Ad *Dicrano-Lejeuneam* accedit, sed differt habitu robustiore ; foliis vittatis ; foliolis apice emarginato-truncatis arguteque dentatis ; bracteis grandilobulatis, bracteola bifida; perianthiis triquetris faciebus carinulatis.—A *Thysano-Lejeunea* distat flagellorum defectu; foliis foliolisque apice argute serratis, illis vittatis; perianthiis obcordatis; cæterum tamen eidem valde affinis: foliorum forma; foliolis emarginato-truncatis; bracteis spinoso-serratis; perianthiis triquetris margine cristatis; ideoque ægrius separanda.—*Ptycho-Lejeunea* differt caule etc. multo minus rigidis, minus ramosis ; foliis subplanis evittatis laxe cellulosis; perianthiis sæpius æqualiter 7–10-plicatis, plicis omnibus exalatis lævissimis.

Dendro-Lejeunea fruticosa (Ldng. et G.)

Bryopteris fruticosa, L. et G. Syn. Hep. 737; *Br. filicina* var. *fruticosa*, eorund. 285.

Hab. in insula *Java* monte *Sajira* (BLUME); ins. *Mauritius* (SIEBER). In hb. cl., LINDBERG vidi.

F 1·1 × ·6; *lob* ·2 ; *c. medii folii* $\frac{1}{80}$, *c vittæ* $\frac{1}{24}$; f^{ta} ·6 × ·5 ; *bracteæ lobus* 1·8 × ·5 ; br^{ta} 1·8 × ·65 ; *per* 2·5 × 1·0^{mm}.

Caules (e caudice repente denudato) frutescentes, 5-pollicares, nigrelli, penduli, in planum ramosi, inæqualiter bipinnati et ex parte dichotomi.

Folia e flavo olivacea, subimbricata, oblonga subacuminata acuta, a basi ultra $\frac{3}{4}$ longitudinis cellulis magnis elongatis pellucidis vittata, apicem versus argute serrata, margine postico medio incurva, basi complicata :

lobulus folio 5–6-plo minor, rhombeus, involutus et subsaccatus (unde ovoideus videtur), sinu exciso-acuto, plica ultra sinum excurrente; cellulæ minutissimæ, opacæ, subæquilateræ, sæpe subquadratæ, superiores paulo longiores quam latæ, leptodermes, fere planæ. cuticula papillulosa, vittæ autem 3–4-plo longiores intus plurisinuatæ.

Foliola dimidium folium parum superantia, subimbricata, oblongo-subrotunda, apice emarginato-truncato parce et argute dentata.

Flores dioici: ♀ in ramo terminales, innovatione unilaterali, vel duabus oppositis, suffulti. Bracteæ foliis longiores, erectæ, ad basin fere usque bipartitæ, lobo oblique ovato-lanceolato sensim acuminato, supra medium spinoso-serrato, *dentibus sursum hamatis*, lobulo duplo minore subangustiore, apice subtruncato acute 3–4-fido; bracteola æquilonga lanceolato-ligulata, apice breviter bifida, segmentis acuminulatis, margine toto fere subduplo inciso-serrata-spinosave.

Perianthia altiuscule emersa, a basi obconicâ rectangulari-oblonga, compressa, triquetra, facie anticâ 2-carinulatâ, lateralibus minus distincte 1–2-carinulatis, apice obcordata brevirostria, margine supero laciniato-cristata, laciniis hamatis, cristulis rudimentariis quoque ad carinam posticam carinulasque adjectis. Calyptra valida, perianthio brevior angustiorque, clavato-turbinata (basi obconica, apice globosa).

Androecia in planta propria, in ramis terminalia, longispica. Bracteæ ♂ sub 10-jugæ, haud confertæ, foliis sat minores, ad ⅓ bilobæ, inflato-complicatæ, lobis oblique ovatis apiculatis acuminulatisve acutis integerrimis vel subdenticulatis, inferiore paulo minore; antheridia magna binata globosa, stipite tenui æquilongo suffulta; bracteolæ ubique obviæ, patulæ, oblongo-cuneatæ acute bidentatæ, apicem versus 1–3-denticulatæ.

SUBGENUS IX.—*BRYO-LEJEUNEA.*

Frullania subg. *Bryopteris* Nees, Hep. Eur.; *Bryopteris* N. et Ldng. Syn. Hep. 284.

Plantæ elatæ 3–12-pollicares robustæ, olivaceæ vel nigro-badiæ, raro virides flavidæve, cæspitosæ stratificatæ. Caules e caudice repente radicelloso erecti pendulive, validi nigrescentes; in typicis (*Pinnatis*) plumæformi-pinnati, ramis suboppositis, deinde bi-vel etiam tripinnati, ramique arhizi, siccando julacei; in *Dichotomis* iteratim dichotomi; ramulis ♀ in omnibus brevibus simplicissimis sæpe crebris.

Folia plus minus imbricata distiche patula, siccando convoluta, magna (1·5–2·1^{mm}), subduplo longiora quam lata, semicordato-ovata acuta accuminatave, apice serrata; lobulus 3–5-plo brevior, raro minutissimus, inflatus vel subplanus, paucicrenulatus integerrimusve; cellulæ superiores parvæ vel fere minutæ subelongatæ, inferiores autem majores duplo longiores (vittam medio folio interdum sistentes) convexæ planæve.

Foliola foliis subduplo breviora subquadrata, apice late rotundato argute dentata.

Flores dioici, raro monoici: ♀ ramulo brevissimo laterali constantes, innovatione nulla; bracteæ 3–6-jugæ, intimæ foliis sublongiores complicato-bilobæ inciso-serratæ, lobis acuminatis, antico lanceolato,

postico lineari; bracteola angusta complicato-carinata serrata, apice plus minus profunde bifida.
Perianthia vix emersa fusiformia alte triquetra inermia.
Amenta ♂ ramulo tenui (ramigeno) folium collaterale excedente constantia; bracteæ 5–10-jugæ diandræ.

Hab. In arborum truncis, rarius in saxis; *Br. L. diffusa* e ramis pendula; omnes monticolæ raro in planitiem descendentes.

Distr. Species circiter 8 descriptæ sunt, omnes Americæ tropicæ montibus humilioribus, a Mexico et Insulis Antillis ad Peruviam et Brasiliam australiorem indigenæ, quarum unica etiam in ins. Java lecta est. Ipse in Andibus Æquatorialibus species 4 (1 novam), vix supra 1500^{m} alt. ascendentes inveni.

A. *Pinnatæ. Caules regulariter pinnati v.* 2–3-*pinnati.*

1. *Bryo-L. fruticulosa.* Caules 3–4-pollicares arcte plumæformi-pinnati. F. apice pauciserrata, lobulo 3-plo breviore inflato fusiformi. Foliola sublatiora quam longa. Br. ovatæ acuminatæ; bracteola ad $\frac{1}{2}$ bifida. Amenta ♂ brevispica, bracteis 4–5-jugis.

2. *Br. L. tenuicaulis.* Caules pedales distanter pinnati et bipinnati. F. apice magis serrata, lobulo 5-plo breviore subplano; cellulæ inferiores elongatæ medio papillatæ. Foliola (ramea præcipue) fere duplo longiora quam lata. Br. filiformi-acuminatæ; bracteol aangusta ad $\frac{1}{3}$–$\frac{1}{3}$ bifida.

3. *Br. L. longispica.* Caules 6–9-pollicares distanter bi-tri-pinnati, ramis apice sæpe flagellaribus. F. apice grosse pauciserrata, lobulo præminuto folio 20-plo breviore Foliola oblongo-rotunda. Amenta ♂ longispica, bracteis 10-jugis.

B. *Dichotomæ. Caules iteratim dichotomi; rami floribus* ♀ *sæpe pinnulati.*

4. *Br. L. diffusa.*

1. BRYO-LEJEUNEA FRUTICULOSA, Tayl.

Lond. Journ. Bot., 1846, p. 382. Syn. Hep. 737.

Hab. Tarapoto, Andium Peruvianorum, in saxis; etiam in monte vicino *Guayrapurina* ad arborum truncos, alt. 400–800^{m}. In sylva Amazonica secus rivulum *Guayaguaca*, fluvio *Pacimoni* tributarium, truncicola. Ins. Sancti Domingo (hb. Hook).

F 1·5 × ·95, *lob* ·5, *cell. infer.* $\frac{1}{30}$—$\frac{1}{25}$, *super.* $\frac{1}{50}$; f^{la} ·75 × ·75, ·8 × ·85; *br.* ♀ 2·4 × 1·5 (*explanatæ*); br^{la} 2·3 × 1·0; *per* 2·3 × 1·0^{mm}.

Caudex in matrice ope radicellarum suarum plus minus longe repens, divisus, caules 3–4-pollicares, arhizos erectos subpendulosve imbricatos edens. Caules nigrescentes validi stricti arcte plumæformi-pinnati, frondem longe lanceolatam basi magis angustatam sistentes; rami medii semipollicares, omnes subcontigui, per paria approximati —quasi oppositi—stricti vel leniter arcuati, angulo 80°–90° patentes, ramulis floriferis, ♀ vel ♂, sæpe pinnulati.
Folia olivaceo-viridia confertiuscula, ad $\frac{1}{3}$ imbricata, patula—siccando valde devoluta, unde caules ramique julacei videntur—suboblique semicordato-ovata acuta, apice subserrata, dentibus 7 vel paucioribus, terminali acuminulato, infra medium involuto-complicata; lobulus

triplo brevior, angustus, lanceolato-fusiformis, apice in folium sensim abiens, margine incurvo integerrimo vel obscure 3-crenato-undulatove; cellulæ superiores parvæ opacæ parum elongatæ, inferiores majusculæ, duplo longiores quam latæ, subpellucidæ, omnes planiusculæ.

Foliola dimidium folium subexcedentia, imbricata, late cuneato-rotunda, apice alte rotundato argute dentata, marginibus lateralibus recurvis (unde magis cuneata evadunt), hilo radicellari nullo.

Flores dioici: ♀ in ramis (raro in ipso caule) laterales, ramulo valde abbreviato constantes, innovatione nulla suffulti. Bracteæ 3-jugæ, erecto-appressæ, apice subpatulæ secundæve; extimæ minutæ inæqualiter bifidæ, bracteolâ oblongâ breviter acute bifida integerrima; intimæ foliis multo longiores, ad medium usque bifidæ, lobo lanceolato acuminato laciniato-serrato, lobulo æquilongo sed multoties angustiore lineari tenui-acuminato canaliculato; bracteola libera angusta complicato-carinata, ad medium usque bifida, laciniata, dimidiis lineari-lanceolatis acuminatis, margine recurvo.

Perianthia bracteolæ exacte æquimagna, rufa, fusiformia, duplo longiora quam lata, ex apice rotundato-truncato obsolete rostellata, alte triquetra, antice convexa sæpeque unisulca, carinis lateralibus valde devexis. Calyptra obovata, stylo elongato tenui coronata. Capsula globosa breviter exserta.

Amenta ♀ in planta propria, in ramis primariis lateralia, folio contiguo paulo longiora. Bracteæ 4–5-jugæ, julaceo-imbricatæ, foliis duplo breviores, inflato-complicatæ, suboblatæ, breviter bilobæ, lobis acuminulatis denticulatis, postico subminore; bracteolæ cuneato-obovatæ, apice emarginatæ subdentatæque. Antheridia 2, stipitata.

Folia foliolaque ad caudicem repentem parva integerrima, illa lata cuspidata, hæc oblato-quadrata. Radicellæ e foliolorum basi ortæ, numerosæ, validæ rufescentes, apice dilatato vel 2–3-fido viscidæ, pro more brevisculæ, inter se liberæ divergentesque.

Ad Tarapoto adest var. *condensata*, saxicola, flavida, fronde breviore et latiore, foliis confertissimis minus serratis, foliolis contra argutius dentato-serratis.

Forma secus fl. Pacimoni caput lecta foliorum lobulos habet minores, cæterum cum typo sat bene convenit.

Bryo-L. tenuicaulis, Tayl., triplo longior est, multo laxius pinnata (intervallis ramorum consecutivorum foliis sub 5-jugis repletis); foliorum dentibus duplo numero, cellulis minutioribus inferioribus papillosis; foliolis persæpe angustioribus; bracteola ad $\frac{1}{4}$ solum bifida.

Bryo-L. filicina (Sw.); *Jungermania filicina*, Sw., Hook. Musc. Exot. t. 142, facie *Bryo-L. fruticulosæ* persimilis, certe diversa est florescentia *monoica* cet. caract. Exemplaria fertilia examinavi e Mexico (Liebmann) et ex Antillis (Husnot).

2. Bryo-Lejeunea tenuicaulis, Tayl.!
in G. L. et N. Syn. Hep. 285.

Hab. Andes Quitenses, in sylvis montanis, alt. 1200–1500^{m}; *Chimborazo*, ad arborum ramulos; *Antombós*, ad saxa. In sylvis juxta *Esmeraldas* legit Jameson.

F 2·0 × 1·3; *lob* ·4 × ·25, *c* $\frac{1}{3\cdot4}$; f^{la} *caulina* 1·15 × 1·0, *ramea* ·9 × ·55, ·8 × ·45, *br* 2·0; br^{la} 1·8 × ·5^{mm}.

Caules pedales validi nigrescentes, stratificati et subintexti, pinnati vel

subbipinnati; rami distantes, subopositi, pollicares et longiores, apice flagellari-attenuati.

Folia subimbricata semicordato-ovata, apice sensim acuta vel subacuminulata serrata, dentibus sub 14, 7 cujusque lateris—raro latere postico paucioribus—margine postico infra medium inflexa, basi subrecte complicata; lobulus 5-plo brevior fere planus semicircularis vel semiobovatus, apice sinuato-transeunte; cellulæ superiores minutulæ, planæ, axi transversâ vel obliquâ, pariete valde incrassato noduloso, basin versus duplo longiores subpellucidæ extus in medio papillam prominulam gerentes.

Foliola imbricata dimidio folio longiora, subquadrata, apice rotundato argute dentato-serrata, margine basin versus recurvula, brevissime decurrentia; ramea oblonga duplo fere longiora quam lata.

Flores dioici: ♀ (juveniles solum visi) ad caulem et ramos primarios quasi-laterales. Bracteæ pluri- (5–6-) jugæ, plures exteriores minutæ, intimæ foliis æquilongæ, profunde (ad $\frac{4}{5}$) bipartitæ, lobis lanceolatis (postico 3-plo angustiore) in acumen filiforme recurvum attenuatis, varie inciso-serratis; bracteola linearis longe acuminata, apice ad $\frac{1}{5}$–$\frac{1}{3}$ bifida, segmentis sæpe forficatis, aliis recurvis.

Cum exemplaribus Jamesonianis ad amussim convenit; etiam (sec. cl. Mitten) cum Swartzianis *Jungermanniæ filicinæ* Sw. Hæc ultima autem, fide Hook. Musc. Exot., t. 142, multo minor est, ramis crebrioribus, foliolis dimidio folio longe minoribus. De florescentia auctor mentionem haud facit, quum tamen in ejus fig. 1 videantur ramuli minuti qui andrœcia simulant, probabiliter *monoica* est, eadem ac in planta Swartziana originali, fide Gottschei, Hepat. Novogranat. p. 61, necnon in exemplis Mexicanis et Antillanis meipso visis.

3. BRYO-LEJEUNEA LONGISPICA, Spruce.

Hab. Andes Peruvianos, in M. *Guayrapurina*, alt. 1000^{m}, ad arbores vestustos: planta mascula sola visa.

F 2·0×·95, 1·9×·9, *lob* 0·1; *c* $\frac{1}{50}$: *f^la caulina* ·8×·7, *ramea* ·55×·3; *br* ♂ *lobi* ·6×·3^{mm}.

Caules 6–9-pollicares, e caudice repente penduli, cæspitosi, distanter pinnati vel inæqualiter sub bi- et tri-pinnati, nigrescentes; rami subopositi, 1–1½-pollicares, apice sæpe flagelliformi-attenuati; ramuli pauci, alterni, pro more ad amenta ♂ redacti.

Folia virescentia, contigua vel perpaulo imbricata, duplo et ultra longiora quam lata, oblique semicordato-ovato-oblonga acuminulata, apice grosse pauci-serrata plana, margine postico medio recurvo, basi explanato; lobulus minutissimus, folio 20-plo brevior, semi-oblongus, ægre conspicuus; cellulæ parvæ opacæ subplanæ, mediæ plures basalesque ceteris duplo longiores et subpellucidæ, costam latam simulantes (ad *Jung. albicantis* instar).

Foliola imbricata, foliis 2½-plo breviora, oblongo-vel quadrato-rotunda, apice lato rotundato grosse dentato-serrata, a basi ad medium fere usque canaliculato-impressa; ramea, pro latitudine longiora, pauci-serrata-incisave.

Amenta ♂ ramulos secundarios sistentia, foliis duplo longiora, tenuia curvula. Bracteæ sub 10-jugæ, ultra ½ complicato-bilobæ, parum inflatæ, lobis ovato-lanceolatis subacuminatis subintegerrimis, inferiore paulo angustiore margineque externo anguste revoluto.

4. Bryo-Lejeunea diffusa (Sw.).

Jung. diffusa Sw. Prodr. Fl. Ind. Occ. 144; *Bryopteris diffusa* Nees in Syn. Hep. 286.

In sylvis umbrosis, ad rivulum *Marona-yacu*, prope *Tarapoto*, etiam ad *Tauaü* prope *Pará*, ex arborum ramulis pendula. In America tropica tota, Brasilia præcipue, hic illic inventa est.

F 2·1 × 1·2, *lob* ·75–·9 (*ab ipsa basi ad acuminis apicem*), *c* $\frac{1}{24}$–$\frac{1}{20}$; f^{la} 1 ·15 × 1·0; *per* 2·2 × ·75 (*explan.* × ·9); *br. lob* 2·0 × ·85; br^{lu} 1·5 × ·4^{mm}.

Caules e caudice breviter repente penduli, 6–12-pollicares, pluries (sæpe 6-ies) dichotomi, angulo dichotomiæ subrecto, *æqualiter foliosi*, ramis in planta fertili sæpe floribus pinnulatis.

Folia olivaceo-viridia subimbricata late patula parum deflexa, siccando arcte convolutiva, oblique ovata apiculata v. brevi-acuminulata acuta, integerrima vel rarius apice grosse paucidentata, antice semicordata, auriculâ oblongâ caulem transeunte, postice medio incurvula basi subrecte complicata; lobulus planus folio triplo fere brevior, rhomboideus v. sublanceolatus, acuminatus 3–5-laciniatus, lacinia media longiore (acumen sistente), a caule liberus (*i.e.*, haud super caulem incurrens); cellulæ majusculæ ($\frac{1}{24}$–$\frac{1}{20}$ ^{mm}.) superiores minores, inferiores sensim majores, subpellucidæ, omnes epapillatæ, pariete ad angulos mediaque latera toruloso-incrassato.

Foliola dimidium folium vix superantia, imbricata, quadrato-oblonga, alia basi parum angustata, apice rotundato-truncata grosse serrata, basi excisa anguste longiuscule decurrentia, medio brevi spatio canaliculata.

Fl. dioici: ♀ laterales, ramulos breves, folia parum superantes, sistentes. Bracteæ sub 6-jugæ, extimæ minutæ, inæqualiter bifidæ subplanæ, bracteolis rectangularibus emarginato-bifidis; intimæ foliis subæquilongæ, basi erectæ apice patulæ, ad $\frac{3}{4}$ usque bifidæ, lobo ovali-lanceolato acuminato, lobuloque breviore et multo angustiore lineari acuminato inciso-serratis-spinosisve, laciniis sæpe iterum denticulatis spinosisve; bracteola minor libera angusta, linearilanceolata complicata, alis recurvis, inciso-serrata, apice breviter bifida, segmentis acuminatis.

Perianthia foliis sublongiora *rufa* linearia triquetro-prismatica, carinis lateralibus valde devexis lævibus, apice rotundato-truncato brevirostellata.—Planta ♂ mihi adhuc ignota.

Subgenus X.—*ACRO-LEJEUNEA*, S.

Phragmicoma, Syn. Hep. pro majore parte.

Lopho-Lejeuneæ (cujus descriptionem videas) ramo fertili simplice unifloro arcte affinis, foliis quoque et foliolis majusculis integris sat similis; differt autem perianthiis parum compressis et, vel 4–5-carinatis, vel (plicis intermediis adjectis) 7–10-plicatis, carinis plicisve omnibus exalatis pro more lævissimis; necnon bracteis grandilobulatis.

Hab. In arboribus et saxis; in America tropica raro extra planitiem visa.

Distr. Per sylvam Amazonicam, ad fl. *Orinoco* cataractas usque, species 2, *A. L. torulosa* L. et L. (cujus forma luxurians est *L. polyphylla*, Tayl.) et *A. L. marsupiifolia* n. sp. sparsius occurrunt. Prior in Brasilia et Guiana late dispersa est; aliæ species in insulis Antillis, sc. *L. linguæfolia*, Tayl.! et *L. Domingensis*, Tayl.; aliæ in Brasilia australi, sc. *Phragmicoma polycarpa*, Nees et *Phr. iuliformis* Nees, inventæ sunt. Ex insulis Asiaticis (præcipue Malayanis) plures species tenemus, omnes cum Americanis, ramo fertili simplice sæpe elongato, perianthio plicato, cæt. caracteribus, arcte adnectas: sunt *Phr. fertilis*, Nees! *Phr. tumida*, N. et M.! *Phr. Hasskarliana*, Gotts.! *Malaccensis*, Tayl.! *Peradeniensis*, Mitt.! etc.

A. *Perianthia 7–9-carinata.*

1. *A. L. torulosa.* Fol. lobulus 3–4-denticulatus, dentibus opacis.

B. *Perianthia 5– (raro 4-vel 6-) carinata.*

a. *Flores monoici.*

2. *A. L. marsupiifolia.* F. accumbentia recurvo-squarrosa ovato-elliptica valde sinuato-complicata; lobulus magnus saccatus, margine appresso integerrimo. Foliola imbricata late reniformia margine toto recurva. Bracteola maxima spathulato-orbiculata integra. Per. obovato-cuneata, carinis posticis altis margineque scaberulis.

[*A. L. linguæfolia* (Tayl.) Pusilla. F. decurvo-concava oblongo-rotunda subrecte complicata; lobulus 3-plo brevior solum ad carinam inflatus, margine unidentato. Foliola cuneato-reniformia apice recurvula. Bracteola oblonga, emarginato-bidentata, dentibus acuminulatis integerrimis. Per. obovata apice obtuse 5– (4-) carinata, carinis lævibus.—*Ins. S. Domingo.*]

[*A. L. Peradeniensis* (Mitt.) Robusta. F. concava semicordato-rotunda, recte complicata; lobulus parvulus angustus convolutus. Foliola arcte imbricata reniformi-cuneata, apice recurvo retusa. Bracteola ligulato-oblonga breviter bifida, segmentis acuminulatis denticulatis. Per. obovata superne alte 5-carinata lævia.—*Ins. Ceylon.*]

b. *Flores dioici.*

[*A. L. Hasskarliana* (Gottsch.) Robusta. F. semicordato-ovato-rotunda concava recte complicata; lobulus 2½-plo brevior anguste convolutus apice grosse bidentatus. Foliola magna oblata obcordato-cuneata, apice profunde emarginata. Br. maximæ vix complicatæ, lobis acuminatis; bracteola obovato-oblonga breviter bifida, segmentis acuminulatis. Per. obovato-oblonga subcompressa postice bicarinata. —*Java.*]

[*A. L. fertilis* (Nees). Tenuiuscula. F. semicordato-ovata subrecte complicata; lobulus magnus subplanus, margine transverso apice 2-dentato. Foliola foliis fere 3-plo breviora, prælata, reniformia, apice recurvo retusa. Br. maximæ vix complicatæ lobis acuminatis; bracteola oblongo-rotunda carinata apice subtruncato varie dentata. Per. obovata turgida pellucida postice obtuse bicarinata.—*Ins. Malayanis.*]

[*A. L. terminalis* Spruce. Pusilla. F. minus densa, late semicordato-ovato-triangularia, sinuato-complicata; lobulus magnus subplanus, margine 3-crenulato. Foliola orbiculato-reniformia retusula. Br. foliis longiores concavæ (haud complicatæ) breviter bilobæ, segmentis acutis; bracteola orbiculata integra. Per. subemersa obovato-oblonga

turgida obtuse 5-6-carinata.—*Ins. Malayanis.* Sub nom. *Phragmicoma ciliaris* Nees in herb. Lindbergii visa a qua tamen valde diversa.]

1. ACRO-LEJEUNEA TORULOSA (L. et L. !).

Phragmicoma torulosa L. et L. ! in Syn. Hep. 294.

Hab. In arborum cortice sylvæ Amazonicæ, prope *Pará;* ad fl. Negro, locis *Punta de Paricatuba* et *Cerro de Cauapuna* (Venezuelæ); ad cataractas *Maypures* fluminis *Orinoco.*

F ·75 × ·5, ·7 × ·5; *lob* ·4 × ·15; *c* $\frac{1}{36}$–$\frac{1}{30}$; f^{la} ·4 × ·5; *br. lob* 1·2 × ·8; br^{la} 1·05 × ·7; *per* 1·25 × ·6 mm.

Late depresso-cæspitosa, pusilla concinna rufo-badia tenera. Caules 1–2-pollicares vage ramosi—interdum subdecompositi—ramique siccando julacei, vel inferne foliis squarrosis exasperati; alii rami decurvi apice subaphyllo sæpe radicantes.

Folia densissime imbricata late patula accumbentia, oblique semicordato-rotundo-ovata, apice vel brevi-triangulari obtuso vel rotundato; margine postico toto late incurva, medium versus subrecte complicata; lobulus duplo brevior, oblique ovatus oblongusve, ad plicam inflatus parum saccatus, margine transverso rotundato 3–4-denticulato (dentibus v. concoloribus v. opacis), medio supero lobo appressus, sinu in lobum sensim transiens—raro apice brevi acuto prominens; cellulæ subconformes parvulæ pellucidæ incrassatæ.

Foliola foliis æquilata, subduplo breviora, orbiculato-reniformia retusula, planiuscula tenuia, basi exciso-amplexante haustorium e radicellis pluribus patulis validis simplicibus ferentia.

Flores dioici et monoici: ♀ in ramo brevi longioreve terminales, innovatione nulla suffulti. Bracteæ foliis fere duplo majores, patulæ, concavæ ad $\frac{1}{3}$ alt. bilobæ, laxe complicatæ, lobo obovato rotundato, lobulo fere æquilongo duplo angustiore ligulato sæpius retuso; bracteola oblonga, ob apicem truncatum fere rectangularis. Folia subfloralia 3–4-juga cæteris caulinis sensim majora, bracteisque propriis subconformia.

Perianthia vix emergentia oblonga rotundato-truncata brevi-rostellata, compressa, antice 2–4-carinulata, postice 3-carinata, carinis fere lævissimis v. scaberulis. Capsula vix exserta, depresso-globosa, profunde 4-fida.

Androecia sæpissime in planta propria, (adveniunt etiam in eadem ac gynœcia), v. ramum totum tenentia v. medio caule posita; bracteæ plurijugæ foliis parum breviores, lobulo eo foliorum vix majore sed turgidiore.

Folia vetustiora sæpe margine supero *recurvo-squarrosa*, novella tamen (siccando præcipue) julaceo-convolutiva.

Phragmicoma torulosa L. et L.! Guiana: (Hb. Hooker). Statura pusilla, foliis confertis, lobulo 3–4-denticulato, textura tenera laxe cellulosa, perianthio plicato, etc., cum nostra bene convenit; differt solum foliis submajoribus rotundioribus, in sicco magis convolutivis.*

* This is the original specimen on which Lindenberg founded the species "torulosa." The lobule is as distinctly denticulate as in my own plant, whereas in Syn. Hep. it is said to be quite entire, which prevented me (at first) from recognising the species.

Var. *polyphylla* (L. polyphylla Tayl.! Lond. Journ. Bot., 1846, p. 390; Syn. Hep. 751). "On coffee-trees at Pará. J. L. R." in hb. Hook.). Certe ad eandem speciem pertinet; differt solum statura elatiore; ramis longioribus; foliis confertissimis, lobuli crenulis magis numerosis (5–8, nec 3 v. 4 solum) interdum tamen obsoletis; foliolis prælate reniformibus. Hanc formam ipse legi ad Caripi prope Pará; et in monte Cauapuna fl. Negro subvarietatem atro-purpuream stellato-ramosam, ramis pinnatis, pinnis brevibus, facie fere *Frullaniæ gibbosæ*.

Phragmicoma fertilis Nees et *Phr. Hasskarliana* Gottsche, stirpes Javenses, floribus ♀ acrogenis cæterisque cataracteribus plane congeneres sunt; lobulos foliorum tamen habent apice solum bi-denticulatos et perianthia 5-carinata.

Obs. By a different, but almost equally natural arrangement, *L. torulosa* might be grouped along with *L. bicolor*, of which it has the lurid blackish colour, varying here and there to yellowish, or blanched; the crenulate lobules and the pluriplicate perianths. *L. bicolor*, however, differs in the innovant dichotomous stems; the acute or acuminate leaves; the decurrent and biauriculate folioles; the serrulate bracts; and the regularly 10-plicate (not 7–9-plicate) perianths.

2. ACRO-LEJEUNEA MARSUPIIFOLIA, Spruce.

Hab. S. Gabriel, juxta fl. *Negro* cataractas, in arborum ramulis.

F ·95 × ·65, *lob* ·4 × ·3, *c* $\frac{1}{3\frac{1}{2}}$; f^{la} ·5 × ·7; *br* 1·0 × ·5; br^{la} 1·1 × ·9: *per* 1·1 × ·8^{mm}.

Humilis subcæspitosa purpurascens, siccando rufo-badia. Caules $\frac{1}{2}$–1-pollicares vage ramosi sat robusti, basi repentes, dein et rami assurgentes.

Folia confertissima accumbentia, lateraliter recurvo-squarrosa patentiaque (nec imbricantia) late ovato-elliptica obtusa vel sæpius rotundata integerrima, infra medium valide sinuato-complicata; lobulus plus duplo brevior subrotundus vel late ovalis insigniter saccatus, dimidio supero tamen inflexo-appressus integerrimus, plica ultra lobuli sinum transeunte; cellulæ mediocres, apicales minores, subbasales majores subelongatæ, omnes subpellucidæ.

Foliola foliis sublatiora, duplo fere breviora, imbricata reniformia repandula, apice lato margineque laterali tam recurva ut in situ quadrata appareant, medio profunde depresso-foveolata.

Flores monoici: ♀ in ramo brevi longioreve, constanter simplice, terminales. Bracteæ foliis submajores profunde bilobæ, lobo antico obovato-lanceolato plano, postico subminore late lingulato margine late recurvo; bracteola sæpe maxima spathulato-orbiculata subplana integra.

Perianthia vix emergentia late obovato-cuneata rotundato-truncata, compressula, antice depressa (raro medio 1-carinulata) postice alte bicarinata, carinis omnibus compressis scaberulis obscure alatis.

Androecia in ramulis terminalia—raro medio caule ramove posita; bracteæ sæpius paucijugæ confertæ complicato-bilobæ parum ventricosæ (minime deorsum saccatæ), lobo obovato, lobulo duplo breviore angustioreque rhomboideo triangulari-acuto plano.

A *L. torulosa* recedit lobulis haud crenulatis et perianthiis solum 4–5-carinatis. In speciebus orientalibus, *Phragmicoma fertili* N., *Phr. Hasskarliana* G., e. a. invenimus perianthia solum 4–5-carinata, istæque species omnes sine dubio veræ *Acro-Lejeuneæ* sunt.

Subgenus XI.—*LOPHO-LEJEUNEA.*

Lejeuneæ species Syn. Hep.

Mediocris, rufescens, raro virescens, siccando sæpe fuscidula, in plagas densas sæpe latas effusa, raro stratificata, in arborum cortice, ramulisque, nec raro aliis hepaticis muscisque irrepentes. Caules 1–2-pollicares pinnatim ramosi; rami inæquilongi sæpe assurgentes, alii *apice indiviso florigeri.*

Folia 0·5–1·0^{mm} longa imbricata, subdistiche patula, apice solo decurva plus minus oblonga raro subrotunda, interdum subfalcata, pro more rotundata raro subacuta, semper integerrima; lobulus mediocris, in una eademque specie major et minor, inflato-saccatus (rarius subplanus) apice v. acuto incurvo v. sæpe lato obtuso in lobum sensim transiens; cellulæ parvulæ—in unica specie fere magnæ—paulo incrassatæ, subplanæ.

Foliola pro more magna, raro tamen folia æquantia, reniformirotunda, planiuscula.

Flores monoici rarius dioici: ♀ in ramo brevi longioreve terminales, sine ulla innovatione. Bracteæ foliis caulinis majores serrulatæ—raro laciniatæ lobulo parvo, interdum subnullo; bracteola magna sæpius orbiculata patelliformis apice lata integra.

Perianthia plerumque emersa pyriformis turbinatave sat *compressa*, 4-carinata, carinis omnibus sæpissime late alatis, alis profunde laciniato-cristatis.

Andrœcia longispica, ramum totum v. ejus apicem solum tenentia.

Platylejeunea, quoad species minores, *Lopholejeuneæ* sat similis, differt habitu serpentino; caulibus pro more elongatis paucirameis; foliolis decurrentibus; *floribus* ♀ *minutis, ramulo brevissimo laterali constantibus*, semper tamen *innovatione parva suffultis; bracteis minutis fere æqualiter bilobis; perianthio parvo* magis compresso, aliarum imo complanato—margine plus minus laciniato-ciliato, faciebus (postica præcipue) apicem versus pro more carinulatis cristulatisque.

L. harpaphylla S. facie *Lopholejeuneæ* persimilis, differt perianthiis obcordato-triangularibus *triquetris*, carinis fere lævibus valde rudimentarie alato-scaberulis; necnon foliorum lobulo eroso-crenulato; bracteolis apice angusto *bidentalis*. Probabiliter subgenus proprium constituerit, sociis *L. Crescentiæ* L. et G., *L. Lehmanniana* G., e. a. perianthiis trigonis a Lopho-Lejeunea æque ac ab Acro-Lejeunea distinctum.

Hab. In arborum cortice vetusto sæpeque in fruticum ramulis, raro in rupibus, aliis Lejeuneis plerumque consociata; extra planitiem haud visa.

Distr. Species sub 12 adhuc recognitæ regionibus tropicis omnibus dispersæ; in America ab Antillis et Mexico ad Brasiliam australem; in oriente per insulas Malayanas et Oceanicas. In sylva Amazonica—nullibi in montes ascendentes—4 species legi, quarum 1 (*L. L. Sagræana* Mont.) in insula Cuba, in Guiana, etc., crescit, ejusque var. *cyclostipa* ad ostia tam fl. Amazonum quam fl. Nigri Africæ; altera, *L. L. subfusca* N. etiam in Chili (?), Java et Mauritii insula inventa est. Eidem subgeneri probabiliter adscripta est *L. plicatiscypha* H. f. et T. e Nova Zelandia.

A. *Perianthia postice bicarinata.*

a. *Monoicæ.*

1. *L. L. Sagræana.* F. apice rotundata, sinuato-complicata, lobulo valde saccato. Foliola magna, rarius etiam parvula, cordato-reniformia orbiculatave. Br. elobulatæ late obovatæ denticulatæ; bracteola maxima orbiculata integerrima. Per. vix subemersa obovato-cuneata 4-carinata, carinis late alatis, alis laciniatis, laciniis denticulatis.
2. *L. L. Mülleriana.* F. sæpius acuta, lobulo variabili nunc turgido nunc angusto v. subobsoleto. Foliola orbiculata reniformiave. Br. fere elobulatæ ovatæ acutæ serrulatæ; bracteola orbiculata interdum apice bidentula, margine recurvulo. Per. altiuscule emersa pyriformia 4-carinata-alataque, alis inæqualiter inciso-serratis.

a. a. *Dioicæ.*

3. *L. L. subfusca.* F. late et subfalcato-oblonga rotundata, lobulo 3-plo breviore rectangulari convolutivo v. minuto. Foliola oblato-orbiculata. Br. distincte lobulatæ, lobo obovato denticulato, lobulo lineari rhomboideo; bracteola oblongo-rotunda integerrima. Per. subemersa obovata 4-carinata-alataque, alis breviuscule laciniatis.

[*L. L. eulopha*, Tayl. F. cordato-rotunda. Foliola foliis imo majora, fere duplo latiora quam longa. Br. distincte lobulatæ laciniato-ciliatæ; bracteola maxima orbiculata argute spinosa. Per. vix emersa pyriformia 4-carinata-alataque, alarum laciniis iterum laciniolatis. *Oceania.*]

B. *Perianthia postice unicarinata.*

4. *L. L. harpaphylla.* Tenella monoica. F. falcata ligulato-oblonga acuta obtusa rotundatave. Foliola subrotunda, alia retusa emarginatave. Perianthia obcordato-cuneata triquetra, carinis lateralibus interrupte subalatis.

1. LOPHO-LEJEUNEA SAGRÆANA, Mont.

In Sagra Hist. de Cuba, Bot., 464, t. 18, f. 1.

Hab. In sylva Amazonica ad Andium radices usque frequens, in arborum truncis, ramulis, foliisque sat frequens, sæpe aliis *Lejeuneis* consociata, ad fl. *Negro* cataractas in scopulorum lateribus. In America tropica tota haud rara videtur.

F ·7 × ·6, ·7 × ·5; *lob* ·2–·15; *c* $\frac{1}{4}$; f^{la} ·5 × ·7; *br* ·8 × ·65; br^{la} ·8 × ·85; *per* ·85 × ·85 (laciniis inclusis) mm.

Majuscula rufo-badia, plagas prostratas sistens. Caules 1–2-pollicares debiles pinnatim ramosi, ramis pro more brevibus sæpe floriferis, dense implexi.

Folia imbricata patulo-decurva valde oblique semicordato-oblonga subrotunda, alia fere rhombea (angulis tamen rotundatis) repandula integerrima, sinuato-complicata; lobulus 3–4-plo brevior ovoideus in caule alte incurrens inflato-saccatus, apice mutico raro acuto; cellulæ parvulæ pellucidæ subinerassatæ, marginem versus sensim minores, prope basin submajores.

Foliola foliis perpaulo minora, sed oblata, cordato-reniformia subplana integra integerrimaque; in ramis elongatis sæpe haud latiora quam longa, subrotunda.

Flores monoici ! ♀ in ramo brevi longioreve terminales, sine ulla innovatione. Bracteæ foliis submajores spathulato-obovatæ-rotundævе, toto margine denticulatæ, elobulatæ; bracteola latior orbiculata patelliformis (medio concava margine late explanata) integerrima.

Perianthia vix submersa obovato-cuneata valde compressa antice depressa postice bicarinata (spatio intercarinali convexulo), carinis omnibus (lateralibus præcipue) alato-cristatis, ala profunde laciniata, laciniis late subulatis, sæpe falcatis, denticulatis, ad 15 cell longis, 8–9-c. latis, alæ cellulis autem duplo minoribus quam cæteri perianthii.

Andrœcia ramulo julaceo constantia, v. in ramo longiore terminalia; bractea 6–10-jugæ laxiusculæ majusculæ turgidæ sæpe intense badiæ.

Var. *α*, *amazonica*: talis ac supra descripta, per totam sylvam Amazonum typica est. (=*L. cyclostipa*, Tayl. !)

Var. *β*, *Montagnei*; laxa elongata tenuior, foliolis subminoribus et solum contiguis v. etiam subdissitis, vix basi cordatis.—Fl. *Negro* superior, ad truncos. Eadem est planta Cubensis Montagnei originalis.

Var. *γ*, *pusilla*, semipollicaris; fol. lobulo valde variabili; perianthii laciniis serratis.—*San Carlos* et *Obidos*, ad arbores pomiferas.

Var. *δ*, *grandiloba*, sc. lobulo dimidium folium fere æquante, subrhombeo obtuso parum inflato. Folia perianthia, etc., typicis conformia. *S. Carlos*, in cortice.

Obs. In hac specie, cæterum sat variabili, perianthium, nisi pro alarum dentibus apice subprominulis, ab involucro constanter celatum est.*

2. Lopho-Lejeunea Müllerіana, Gottsche.

Hab. In sylvis fl. Amazonum et *Negro*, in cortice vetusto sæpeque in fruticum ramulis, aliis Lejeuneis consociata, locis *Caripí* pr. *Pará*, *S. Gabriel* et *S. Carlos* fl. *Negro*, etc.

F ·6 × ·45, ·55 × ·4; *lob* ·3–·25–·18–0; *c* $\frac{1}{4\cdot5}$; f^{la} ·35 × ·4, ·3 × ·35; *br* ·9 × ·6; br^{la} ·75 × ·75; *per* 1·1 × ·75^{mm}.

Rufo-badia olivaceave, repens, interdum subcæspitosa. Caules $\frac{1}{2}$–1-pollicares inæqualiter pinnatim ramosi, valde intricati, ramis sæpe assurgentibus.

Folia ad $\frac{1}{3}$–$\frac{1}{2}$ lat. imbricata, patentia, oblique oblonga ovatave, interdum basi semicordata, apice sæpe valide decurvo abrupte acuta obtusave

* Pulchra species *L. Sagraeanæ* affinis, paulo robustior—*Brachio-Lejeuncam bicolorem* subæquans—est Lejeunea eulopha, Tayl. ! in *Lond. Journ. Bot.*, 1846, p. 387, in Ins. Pacificis a Nightingale lecta, cujus descriptio sequitur. Caules subramosi, pro parte dichotomi. Folia imbricata decurvo-concava, e basi constrictâ inflato-lobulatâ cordato-rotunda, laxiuscule areolata. Foliola foliis imo majora, reniformia, duplo fere latiora quam longa, margine supero recurvo. Flores dioici: ♀ terminales, vel e dichotomia (ramulis suboppositis tamen haud bracteis ipsis utrinque adnatis sed e foliorum proximorum basi externa oriundis), vel in ramulorum apice simplice insidentes, sine ulla innovatione. Bracteæ foliis majores, ultra medium bilobæ, spinosæ vel laciniato-ciliatæ, lobo semioblongo obtuso, lobulo breviore multo angustiore lanceolato-triangulari acuto; bracteola maxima orbiculata—e margine recurvo ad speciem spathulata—toto margine argute spinosa. Foliolum infraflorale apice spinulosum. Perianthia vix emersa, pyriformia, compressula 4-carinata, ad carinas apicemque alata, alis profunde laciniatis, laciniis iterum laciniolatis sæpeque bifidis.

raro subapiculata—aliquando fere omnia rotundata—infra medium sæpissime complicata, ad plicæ apicem valide sinuata v. fere recta; lobulus folio subtriplo brevior, variabilis autem, nunc valde turgido-saccatus, nunc perangustus fere cylindricus (transversalis) nunc demum obsoletus, muticus; cellulæ parvulæ pellucidæ, pariete in angulis et in medio latere subincrassatæ.

Foliola foliis vix duplo breviora, subdissita, orbiculata vel sæpius reniformia, basi amplexantia, cellulis minoribus marginata.

Flores monoici: in ramo brevi longioreve simplicissimo terminales. Bracteæ foliis dimidio longiores ovatæ acutæ superne plus minus serrulatæ, angustissime complicatæ (vel non), lobulo lineari persæpe obsoleto; bracteola orbiculata, apice pro more rotundato retusulove rarissime breviter bidentulo, margine toto anguste recurvulo obsolete denticulata.

Perianthia f. caulinis subduplo longiora pyriformia v. subcuneata, rotundato-truncata subrostellata, valde compressa, antice depressa, postice bicarinata, margine carinisque ala grosse inæqualiter inciso-serrata fragili auctis.

Androecia teretia ramulo sæpius toto constantia; bracteæ plurijugæ laxiuscule equitantes complicato-concavæ, foliis subduplo breviores, apice breviter subinæqualiter bilobæ, lobis acutis obtusisve, antheridiis binis.

Folia vel abrupte acuta vel in fl. ♀ vicinia præcipue minute apiculata, ramorum sterilium tamen pleraque rotundata.

3. LOPHO-LEJEUNEA SUBFUSCA, Nees?

Enum. Pl. crit. Jav. 36; Syn. Hep. 315.

Hab. Fl. *Casiquiari*, in arborum truncis inundatis, supra muscos repens.

F ·55 × ·5, *lob* ·18; *c mediæ* $\frac{1}{35}$, *marg.* $\frac{1}{60}$; f^{la} ·35 × ·4, *br lob* ·65 × ·4; br^{la} ·6 × ·5^{mm}.

Pusilla rufo-fusca prostrata. Caules $\frac{1}{2}$-pollicares parum ramosi.

Folia perpaulo imbricata late oblonga subfalcata rotundata, basi antica semicordata, recte complicata; lobulus 3-plo brevior subrectangularis, ex involutione semiovatus, apice brevi occulto, sæpe ad plicam parvam redactus; cellulæ mediæ mediocres parum elongatæ pachydermes subpellucidæ (annulo chlorophylli subangusto), marginales fere duplo minores unde folia subopaco-marginata.

Foliola $\frac{1}{2}$ folium superantia—hic illic autem multo minora—oblato-orbiculata subintegerrima.

Fl. dioici (?): ♀ in ramo brevisculo folioso terminales. Bracteæ foliis paulo longiores, complicatæ; lobus oblique obovatus denticulatus—alter obtusus alter acutus; lobulus paulo brevior multo angustior lineari-rhomboideus, apice lanceolato denticulatus; bracteola oblongo-rotunda integerrima.

Perianthia subemersa triangulari-obovata rotundato-truncata brevi-rostellata valde compressa, postice bicarinata—carinis apice conniventibus, spatium lanceolatum includentibus, marginibus carinisque fere a basi laciniato-alatis, laciniis breviusculis denticulatis.

(Androecia nulla inveni.)

A *L. Mülleriana* differt floribus dioicis; foliis latioribus, cellulis paulo

majoribus; bracteis distincte lobulatis, lobo latiore; denique perianthiis latioribus minus alte emersis.—Quum specimina perpauca habui, de florescentia minus certus sum. Probabiliter a *L. Mülleriana* haud bene diversa erit, et tam una quam altera ad *L. subfuscam*, pro varietate, referenda.—Forma *Lej. subfuscæ* N. typica, primum in terris Malayanis inventa, postea etiam e Chili allata fuit, fide cl. auct. 'Synopseos Hepaticarum.'

4. Lopho-Lejeunea harpaphylla, Spruce.

Hab. Ad flumina Amazonum (*Santarem*), *Negro* (*S. Gabriel* et *S. Carlos*), *Uaupés* (*Panuré*), *Bombonasa*, etc., constanter in cortice, ramulorum præcipue.

F 1·0 × ·6, ·9 × ·55, *lob* ·4–·5, *c* $\frac{1}{30}$–$\frac{1}{25}$; f^{la} ·5 × ·5, ·55 × ·55; *br* 1·05 × ·4; br^{la} 1·05 × ·6; *per* 1·1 × ·8, 1·1 × ·65^{mm}.

Tenella pallide viridis pellucida, siccando fuscidula. Caules pollicares subrepentes, ramis assurgentibus inæquilongis, pro more brevibus, subbipinnati.

Folia subimbricata oblique et subfalcato-oblonga ovaliave obtusata rotundatave, raro superiora acuta, basi antica rotundata angustave—raro semicordata, postica decurrente, recte complicata; lobulus duplo brevior semiovatus folii medium versus sensim (sine ullo dente prominente) transiens, subplanus, eroso-crenulatus; cellulæ mediocres (basales sensim majores, marginales duplo minores et quadratæ) subelongatæ, pariete ad angulos et media latera incrassato, chlorophyllo parco.

Foliola subimbricata, superiora sensim crescentia, dimidio folio æquilonga, rotundo-quadrata-obovatave, retusula—raro emarginata—repanda subplana, inferiora radicellas longas in fasciam colligatas proferentia, superiora pleraque arhiza.

Flores monoici: ♀ in ramis sæpe elongatis terminales, sine ulla innovatione. Bracteæ foliis caulinis sublongiores erecto-patentes oblique lanceolatæ acutæ, a basi ad medium usque plica perangusta auctæ; bracteola æquilonga, latior, ovali-lanceolata obtuse carinata, acuta bidentulave. Foliolum infraflorale bracteola paulo brevius, constanter bidentatum.

Perianthia subemersa pellucida obcordato-cuneata compressa, antice depressa vel parum convexa, postice alte anguste unicarinata, apice in rostellum planum abeuntia, margine interrupte subalata, vel solum angulata, vel superne dente uno alterove obtuso armata.

Androecia caules et ramos terminantia; bracteæ plurijugæ, foliis sensim minores, complicatæ, basi sola ventricosæ, planilobæ, lobo obtusato, lobulo duplo angustiore paulo breviore lineari-rhomboideo subacuto.

Forma *breviloba*, foliis subcontiguis minoribus ligulato-oblongis apice variis, lobulo ad plicam 6-plo breviorem semilanceolatam redacto, perianthio alte emerso, advenit prope S. Gabriel.

Forma *longiloba*, foliis magis confertis, plerisque rotundatis, rectioribus, ad vel ultra medium in lobulum involutis, ad fl. *Uaupés* lecta fuit.

Tertia forma, minor, tenerrima, foliis plerisque acutis, prope *Santarem* habitat.

SUBGENUS XII.—*PLATY-LEJEUNEA*, S.

Elata, arborum ramulis foliisque repens, dein pendula, saturate badia v. rufo-badia. Caules 1–6-pollicares et longiores, serpentini flaccidi inæqualiter pinnati, vel pinnatim divisi, apice sæpe longe simplices.

Folia magna (1·3–2·6^{mm}) parum (raro dense) imbricata, siccando fere immutata, horizontaliter patula, apice tamen margineque antico sæpe incurva, postico plus minus recurvula, unde ex ovato-oblongo ligulata videntur, rotundata obtusave, rarius apiculata, integerrima, basi sinuato-complicata; lobulus parvus turgidus sæpe cucullatus; cellulæ majusculæ mediocresve subpellucidæ pariete incrassato.

Foliola foliis sat breviora, sæpe autem latiora, obovato-orbiculata v. reniformia, rotundata retusulave integerrima. Haustoria e radicellis valde numerosis fastigiatis—sæpe ex parte colligatis—scopæformia.

Fl. dioici, raro monoici: ♀ ramo brevissimo, foliis minutis 1- (raro pauci-) jugis infra bracteas stipato, insidentes, innovatione brevi parvi-paucifolia semper suffulti. Bracteæ minutæ, foliis 2–4-plo minores, obcordato-bilobæ, complicatæ, lobis exacte (v. fere) æquimagnis; bracteola angusta, apice retusa v. tridentata, raro bifidula.

Perianthia ultra bracteas emersa, f. caulinis tamen semper sat breviora, oblonga obovatave, apice rotundata, retusa, obcordatave, rostellata, valde compressa, margine toto, v. saltem supero, inciso-fimbriata-ciliatave, facie postica apicem versus valde humiliter 1- 2- v. 3-carinulata, carinis spinoso-alatis inermibusve, interdum papillis pilisve sparsa, vel omnino nuda, antice subplana inermia raro subspinulosa.

Androecia v. terminalia, v. ramulo proprio constantia, leptostachya, polyphylla.

Hab. In arborum truncis ramulisque, imo in foliis vivis, persæpe aliis hepaticis et muscis irrepentes, sylvas planitiei et montium humiliorum densas humidas diligentes.

Distr. Species 8 vel 10 adhuc cognitæ omnes Americæ tropicæ incolæ, earum unica (*Pl. L. transversalis*) etiam in Australia et ins. Hawaii inventa est, nulla tamen Asiatica. 5 species a meipso lectæ per sylvam Amazonicam et Andes inferiores (tam occidentales quam orientales) solum ad alt. 1200^{m} usque, habitant.

A. *Dioicæ.*

a. *Folia rotundata.*

1. *P. L. subrotunda.* F. confertissima late semicordato-ovata; lobulus 4-plo brevior bifidus, segmento inferiore majore cucullato, superiore rhombeo plano. Foliola magna late imbricata reniformia, fere duplo latiora quam longa, breviter decurrentia retusa, toto margine recurvulo, basin versus foveolata. Br. lobo antico subminore.
2. *P. L. tæniopsis.* F. parum imbricata prælonga semicordato-ovato-oblonga, margine antico incurvula, postico valide recurva; lobulus 6-plo brevior cucullatus. Foliola subimbricata reniformia longe decurrentia apice retuso recurvula, medio unisulca. Br. lobo antico subminore. Per. obovato-cuneata, margine supra medium inciso-ciliata, dorso obsolete bicarinata pauciciliataque.

b. *Folia apiculata.*

3. *P. L. Hobsoniana.* F. vix subimbricata ovato-ligulata, lobulo minuto. Foliola orbiculata longe decurrentia. Per. obcordato-elliptica, margine fere toto alata longissimeque ciliata, postice subspinosa, antice fere inermia.

B. *Monoicæ.*

4. *P. L. vincentina.* F. imbricata ovato-oblonga abrupte apiculata raro mutica. Foliola imbricata reniformia. Per. obovata margine supra medium ciliata, postice alte convexa medioque dense ciliata.
5. *P. L. pogonoptera.* F. subimbricata ovato-ligulata rotundata. Foliola obovato-orbiculata contigua. Per. oblonga, postice magis distincte 2-carinulata, margine carinisque alata denseque spinoso-ciliata.

1. PLATY-LEJEUNEA SUBROTUNDA, Hook.

Jung. subrotunda, Hook. in Kunth. Syn. pl. æquin., v. i. p. 41. G. L. et N. Syn. Hep. 312.

Hab. Ad fl. *Negro* cataractas, in truncis putridis, socia *L. Sagræana.*

F 1·3 × 1·05; *lob* ·35; *c* $\frac{1}{3.5}$; *f*^{la} ·7 × 1·2; *br. lob. sup.* ·65 × ·38, *inf.* ·8 × ·5; *br*^{la} ·5 × ·35^{mm}.

Badia late dense implexo-cespitosa. Caules 1–2-pollicares, sæpe tota longitudine matrici arcte adhærentes, vage subramosi, ramique sæpe valde ramulosi, ramulo perbrevi, paucifolio, ♀ v. neutro, e folii fere cujusque axilla egrediente, eidemque subæquilongo.

Folia confertissime imbricata late oblique semicordato-ovata, apice valide decurvo rotundata, margine supero incurvulo appressa, infero leniter recurvulo ante lobulum profunde sinuata; lobulus fere 4-plo brevior ovalis subbifidus, segmento inferiore majoreque subrotundo apice cucullato, superiore parvo rhombeo subplano; cellulæ parvulæ pellucidæ, ambitu opacæ, rotundo-hexagonæ, pariete incrassato.

Foliola late imbricata foliis fere æquimagna, sed fere duplo latiora quam longa, a basi breviter cuneato-decurrente reniformia, apice late retusa, margine toto recurvula cellulisque parvis uniseriatis subopacis marginata, basin versus facie internâ foveolata, externâ umbonata, et ex umbone radicellas fasciatas, apice parum divergentes proferentia.

Flores dioici: ♀ ramulis brevissimis insidentes quasi-laterales innovatione parva suffulti. Bracteæ foliis subduplo breviores, obcordato-bilobæ, complicatæ, lobis subæqualibus, v. antico paulo minore, obovato-trapezoideis; bracteola minor oblonga apice bifida bidentatave.

Obs. The short ramuli are usually female, rarely neuter. In some stems they spring from nearly every leaf-axil, and each bears a ♀ flower, with only 1 or 2 (rarely more) pairs of minute leaves beneath it. Adnate to the outer bract, springs an innovation, at a very acute angle, bearing few smallish (but not minute) leaves. The bracts are complicate and so shortly bifid that they are best described as obcordate, with a deep sharp emargination. In the outer bract (which widely imbricates the inner) the upper (antical) lobe is very slightly the smaller, leaving a narrow rim of the lower lobe visible all around the free edge, when the two are pressed

together; whereas in all other Lejeuneæ the upper lobe of the bract is always larger than the lower. The inner bract is either quite symmetrical, having the two lobes exactly equal, or the upper lobe is smaller, as in the outer bract.

2. PLATY-LEJEUNEA TÆNIOPSIS, Spruce.

Hab. In sylvis fl. Amazonum, præcipue humilioribus, ramulis foliisque vivis adrepens sæpeque longe pendula; locis: *Pará*, *S. Gabriel* et *S. Carlos*, *Yurimaguas*, fl. *Bombonasa*, etc.

F 2·6 × 1·5, 2·0 × 1·5; *lob* ·4 × ·3; *c* $\frac{1}{3-4}$; f^{la} 1·5 × 1·8; *br* ·7 et ·5 *longæ; per* 1·4 × ·9^{mm}.

Elata rufo-badia, strato tenui late repens. Caules 6-pollicares et longiores debiles, pinnatim ramosi, aliis ramis brevissimis floriferis, aliis elongatis fere simplicibus sæpe pendulis.

Folia parum imbricata subdivergentia, siccando vix mutata, maxima, semicordato-ovato-oblonga, rotundata vel truncato-rotundata, basi caulem late transeuntia, margine antico apiceque incurvula, postico (basi apiceque exceptis) valide recurva, prope basin profunde sinuato-complicata; lobulus sub 6-plo brevior paraboloideus (axi cauli parallela, plica transversa) cucullato-concavus muticus; cellulæ majusculæ subæquilateræ, pellucidæ, ambitu subopacæ, pariete ad angulos mediaque latera incrassato, inferiores submajores.

Foliola subimbricata foliis subminora sed latiora, reniformia longe decurrentia, apice retuso recurvuloque repanda, a basi fere ad apicem usque sulcato-canaliculata.

Flores dioici: ♀ ramulo brevissimo, cum perianthio folium caulinum vix æquilongo, terminales, innovatione minuta suffulti. Bracteæ foliis 4-plo minores obcordato-bilobæ, lobis complicatis subæqualibus, vel postico subminore ligulatoque; bracteola tenera angusta ligulato-cuneata apice truncato obtuse 3-dentata.

Perianthia parva obovato-cuneata rotundata retusave brevirostria valde compressa, margine supra medium inciso-ciliata, aliis ciliis sæpe prælongis hamatis, facie posticâ convexulâ carinis 2 valde approximatis cito in unam obtusam confluentibus, pauciciliatis, percursa. Calyptra perianthio $\frac{1}{3}$ brevior obovata, infra medium 2 c. crassa, apice irregulariter rupta.

Andrœcia subjulacea ramulis micro-polyphyllis constantia, rarius rami apicem solum tenentia. Bracteæ cymbiformi-concavæ ultra $\frac{1}{2}$ bilobæ, lobis semiovatis (margine externo subrecto) antico rotundato, postico vix minore obtuso.

Obs. Folia, e margine infero recurvo, supero incurvo, tota fere longitudine æquilata videntur, sive ligulata et subfalcata. Cellulæ foliorum subplanæ, bractearum ♂ et ♀ distincte convexo-prominulæ, perianthii trigonis pulchre pellucidis.

Bractea interna major est quam externa, basique innovationi perbrevi, foliis parvis bijugis præditæ, adnata est.

Forsan eadem species erit ac *L. granulata*, Nees in Mart. Fl. Bras. I., p. 352; Syn. Hep. 311; quum tamen nihil dixerunt cl. auctores de foliorum marginis postici recurvatione insigni, nec de perianthii ciliis posticis, ad illam referre non ausim. Florescentiam hujus sectionis sub silentio omnes auctores relinquunt.

3. PLATY-LEJEUNEA HOBSONIANA, Lindenb.

Syn. Hep. 313; Gottsche, Mex. Leverm. 181.

Hab. Chimborazo, in sylvis ad 1200^{m} alt., e ramulis foliisque pendula; etiam in Mexico et ins. S. Vincentii.

F 1·9 × 1·3, *lob* ·075, *c* $\frac{1}{24}$; f^{la} 1·25 × 1·2; *br* ·9 × ·7; br^{la} ·9 × ·55; *per* 1·6 × 1·25^{mm}.

Elata flaccida olivacea badiave, primum repens dein pendula. Caules 4–6-pollicares, flexuosi, inæqualiter pinnati.

Flora basi sola imbricata, superne dissita, subplana, divergentia, oblique ovato-ligulata ex obtuso apiculata, margine postico infra medium recurvulo longiuscule decurrente basique ipsa minutissime lobulata; lobulus plus 20-plo brevior, margine plerumque incurvus; cellulæ pellucidæ majusculæ. Folia interdum basi antica anguste semicordata.

Foliola foliis paulo minora, imbricata, orbiculata, ob alas longe decurrentes subspathulata, repanda, apice rotundata vel subretusa, medio haud profunde canaliculata, cæterum fere planissima, vel margine leviter incurvo foliis appressa, basi ipsa hinc longius sensimque decurrentia.

Flores dioici. Ramuli ♀, cum suo perianthio, folium caulinum proximum vix æquantes, basi foliis unijugis minutis ovalibus, foliolo interposito rotundo, stipati. Bracteæ foliis duplo breviores—altera innovationi minuta microphylla basi adnata—complicatæ parum inæquilobæ, lobis abrupte acutis, postico subminore; bracteola ligulato-oblonga, a medio recurva, apice breviter bifida, segmentis acutis obtusisve.

Perianthia foliis breviora obcordato-obovata-ellipticave valde compressa rostellata, fere ab ipsa basi ala profunde ciliato-laciniata circumcincta, facie antica convexula lævia nisi marginem versus spinulis paucis obsita, postica convexo-carinata medium versus spinis setisve plurimis armata.—Cilia marginalia ad semimillimetrum longa, 12 vel etiam 16 cellulas longa, basi 2 v. 3 cell. lata.

L. Hobsoniana typica (Syn. Hep. l. c.) vix differt nisi foliolis margine recurvulis et bracteola solum emarginata.

A *L. Vincentina* et *L. pogonoptera* certe diversa videtur: caule 4-plo elatiore; foliis vix imbricatis longioribus (lingulatis) longe decurrentibus planis minutissime lobulatis; foliolis planis orbiculatis decurrentibus; floribus dioicis; bracteis majoribus acutilobis; bracteola bifida; perianthiis margine longissime laciniato-ciliatis.

Obs. The perianth is rather thickly and widely set with hair-like processes about the middle of the back, but smooth near the top and bottom, and there is a thin crest of cilia on each side of the medial group, on a raised line (carinula) parallel to and near the margin.

4. PLATY-LEJEUNEA VINCENTINA, Gottsche.

Hab. Prope *Guayaquil*, in cortice *Theobromatis Cacao* præcipue: rarius. Ex ins. S. Vincentii primum alata.

F 1·25 × 1·0; *lob* ·3; *c* $\frac{1}{28}$; f^{la} ·75 × ·95; *br* (*explan.*) ·6 × ·45; br^{la} ·55 × ·3; *per* 1·1 × 8^{mm}.

Pusilla, prostrata rufo-fusca. Caules pollicares subramosi flaccidi.

Folia ad $\frac{1}{2}$ imbricata horizontalia, apice deflexa, cæterum plana, oblique

ovato-oblonga ex rotundato apice brevi-apiculata, raro mutica, basi complicata, plicâ transversâ; lobulus 4-plo brevior cucullato-inflatus —in situ fere globosus; cellulæ mediocres pachydermes pellucidæ annulo opaco cinctæ.

Foliola plus dimidio breviora imbricata reniformia basi exciso-subdecurrentia, alia apice retusula, fere plana v. recurvo-convexula, solum ad pilum radicelliferum externe gibba.

Flores monoici: ♀ in ramo brevissimo terminales, innovatione paucifolia suffulti. Bracteæ foliis duplo breviores obovato-oblongæ, obcordato-bilobæ, segmentis rotundatis, laxe complicatæ, carinatæ, altera (interior) submajor, ad carinam papilloso-subalata; bracteola obovato-oblonga retusula. Ramulus fertilis infra florem sæpissime folium unicum minutum inæqualiter bilobum gerit, foliolo adjecto minuto nullove.

Perianthia f. caulinis subminora obovata subobcordata antice depresso-plana lævia, postice alte convexa (e carinis duabus, inferne dissitis, apice conniventibus, in unam altam prælatam coalitis), margine a medio saltem hanato-ciliata, ciliis 4–6 c. longis, postice ad convexitatem supra medium ciliis dense conspersa. Calyptra paulo minor tenuis pyriformis.

Amenta ♂ ramulis caule inferiore insidentibus, folio caulino paulo longioribus, constantia; bracteæ mediocres 6–7-jugæ haud confertæ.

L. pogonoptera differre videtur foliis minus confertis longioribus constanter muticis; foliolis orbiculatis nec reniformibus; perianthiis oblongis magis regulariter ciliatis; anne tamen specifice ?

5. PLATY-LEJEUNEA POGONOPTERA, Spruce.

Hab. Prope *Pará*, in cortice cum aliis *Lejeuneis;* ad fl. *Huallaga* Peruviæ orientalis, supra *Neckeram undulatam* repens.

F 1·35 × ·95, *lob* ·2–·3, $c\frac{1}{2\cdot5}$; f^{la} ·7 × ·7 × ·75 × ·75; *br* ·55 × ·55; br^{la} ·5 × ·3; *per* 1·0 × ·9^{mm} (ciliis exclusis).

Humilis, sat robusta, rufa, prostrata. Caules 1½-pollicares parum ramosi, apice sæpe masculi.

Folia ad ⅓ lat. imbricata, late patula et vel incurvula vel a basi ad apicem usque leniter recurvula (exindeque subconcava a fronte visa), semicordato-ovato-ligulata repando-rotundata, basi recte complicata; lobulus folio 4–6-plo brevior alte semiovatus inflatus, ad sinum in folium quasi acuminato-transiens; cellulæ majusculæ hexagonæ planæ pellucidæ, ambitu opacæ, inferiores perpaulo majores.

Foliola duplo fere breviora, contigua, obovato-orbiculata subdecurrentia, margine toto recurva, raro radicellifera.

Flores monoici: ♀ in ramo brevissimo terminales, innovatione brevi parvifolia suffulti. Bracteæ foliis triplo fere minores orbiculatæ complicatæ; ab apice ad ⅓ bilobæ, lobis æqualibus obtusis; bracteola angusta obovato-cuneata retusa. Ramus ♀, cum suo perianthio, folium caulinum vix æquat.

Perianthia bracteis duplo longiora, oblonga, apice rotundato retusulove brevirostria, valde compressa, antice depressa lævia, postice gibba bicarinata, margine carinisque dense spinoso-ciliatis, ciliis 6–10-cellulas longis, basi 1–2 cell-latis patulo-adscendentibus hamatisve.

Calyptra perianthio vix minor, unicam cellulam crassa, infra apicem breviter transverse rupta.

Androecia spicata in caule ramisque terminalia — persæpe ramulo fœmineo suffulta—julacea circinata strictave; bracteæ 6-plurijugæ, foliis duplo minores equitantes, inferne parum turgescentes, ad medium bilobæ, lobis subæqualibus, antico obtuso, lobulo perpaulo minore acuto.

Obs. Carinæ perianthii posticæ in planta Paraensi humiliores sunt, interspatio lævi; in Huallagensi altiores, interspatio spinis squamulisve paucis obsito.

SUBGENUS XIII.—*ANOPLO-LEJEUNEA*, S.

Habitu, ramificatione, foliorum foliolorumque forma, floribus ♀ quasi-lateralibus brevi-innovatis, *Platy-Lejeuneæ* sat conformis; differt autem statura humiliore, colore pallido, bracteis submajoribus parvilobulatis, et (præ aliis) perianthiis turgidis, paulo compressis, supra medium altiuscule 5-carinatis perfecte inermibus.

Hab. unica species ad fl. *Negro*, in cortice, supra alias *Lejeuneas* repens.

1. ANOPLO-LEJEUNEA HERPESTICA, Spruce.

Hab. Ad fluminis *Negro* cataractas, in cortice.

F 1·0 × ·8, *lob* ·4, *c* $\frac{1}{3\cdot5}$; *f*^{la} ·5 × ·7; *br* ·9; *bi*^{la} ·6; *per* 1·0 × ·6^{mm}.

Majuscula pallida prostrata. Caules fere bipollicares flexuosi pinnulati.

Folia subimbricata late patula decurvula infra medium complicato-biloba, plicâ fere transversâ, rectâ vel subconcavâ; lobus oblongo-rotundus, basi antica semicordata caulem velans; lobulus plus duplo brevior semiellipticus—fere semicircularis—cucullato-concavus, apice in lobi marginem sensim transiens; cellulæ mediocres omnes fere conformes æquilateræ pellucidæ fere vacuæ, pariete incrassato.

Foliola dissita, foliis fere æquilata, duplo tamen breviora, cuneato-reniformia repanda tenuia fragilia, radicellas fasciculatas apice subpatentes gerentia.

Flores dioici: ♀ in ramo brevi, foliis sub 3-jugis vestito, terminales, innovatione brevi simplice—raro prolifera—suffulti. Bracteæ foliis paulo minores erecto-patulæ oblique ovales apice cucullato obtusæ, basi cum lobulo parvo oblongo complicatæ; bracteola cuneata truncato-retusa (in floribus sterilibus sæpe latior apiceque subbifida).

Perianthia (vix matura) subemersa cuneato-pyriformia brevirostria compressula, medio supero altiuscule 5-carinata, carinis repandis inermibus.

SUBGENUS XIV.—*BRACHIO-LEJEUNEA*, S.

Phragmicomæ species Syn. Hep.

Habitu, statura, etc. *Homalo-Lejeuneæ* persimilis. Florescentia typica probabiliter eadem, sc. monoica (autoica et paroica), sæpe autem ex abortione dioica.—Plantæ ♀ eodem modo brachiato-dichotomæ, steriles tamen elongatæ laxe pinnatæ, ramis alternis. Folia fere constanter integerrima,

lobulo magno, sæpe = folii $\frac{1}{2}$, margine 3–7-crenulato, crenulis pro more opacis, raro obsoletis. Bracteæ aliarum sp. alatæ, sæpe integerrimæ.

Perianthia parum compressa, 3–10-*carinata-plicatave*—primum (ut videtur) 3–4-gona, plicis intermediis adjectis, in aliis sp. 8–10-plicata fiunt.

Homalo-Lejeunea Mackaii et *Brachio-Lejeunea laxifolia* nexum præbent inter has duas sectiones, vix pro subgeneribus distinctis habendas; quum in *L. Mackaii* folia integerrima obtusissima inveniuntur, contra affinium indolem; in *L. laxifolia* perianthium, carinis posticis interdum tam approximatis obtusatisque ut in unicam latam fere confluunt, exinde trigonum evadit, itaque ab eo *L. Mackaii* paulo discrepat.

Hab. In arborum truncis ramisque, raro in rupibus vel in ipsa terra inter lichenes, cespites depressos pluristratos sæpe pendulos efficiens; semper monticola mihi visa.

Distr. Per Andes sylvaticos Columbianos, Quitenses et Peruvianos, alt. 600–3500^{m}, nullibi in planitiem descendens; etiam in terris montosis Brasiliæ australioris, insularum Antillarum et Mexico. Ipse 2 species solum legi, quarum una, *B. L. bicolor* in regione neotropica prælate distributa est.—Alias paucas species americanas cognovimus; aliæ ex India orientali (præcipue ex insulis) proveniunt.

A. *Perianthia* 4– (3-) *plicata.*

1. *Br. L. laxifolia.* Fl. ♂ hypogyni. F. semicordato-ovata acuta apiculatave. Foliola orbiculata.
2. *Br. L. securifolia.* Fl. ♂ a ♀ dissiti. F. obovato-securiformia obtusata. Foliola cuneato-rotunda.

B. *Perianthia* 10-*plicata.*

3. *Br. L. bicolor.*

1. BRACHIO-LEJEUNEA LAXIFOLIA, Tayl.

Phragmicoma l. T. in pl. Jamesonianis; Mitt. in Lond. Journ. Bot. 1851.

Hab. In Andibus Quitensibus sylvaticis, alt. 2000–3500 m., ex arborum ramulis pendula: *Pangor; Guayrapata*, etc.; *Pichincha* in stillicidiis.

F 1·3 × 1·4 (*lobulo incluso*); *lob* ·65; *c* $\frac{1}{10}$; *f*^{la} ·8 × ·8, ·6 × ·6; *br* 1·0–1·2; *per* 1·75 × ·7, 1·35 × ·7^{mm}.

Subcæspitosa rufo-fusca. Caules 1–3-pollicares, sat ramosi, steriles laxe pinnati, fertiles plus minus dichotomi.

Folia imbricata, supra plicam decurrentem erecto-patentem divergentia, oblique semicordato-ovata-oblongave, apice valde decurvo (in sicco convoluto) acuta subapiculatave, margine antico toto (in sicco præcipue) peranguste recurvulo; lobulus duplo brevior obtriangularis, ad plicam subinflatus, ad marginem appresso-planus transversus cellulisque 3 prominulis opacis tricrenulatus; cellulæ parvulæ, pariete ad angulos incrassato, inferiores sensim submajores, marginales fere minutæ quadratæ.

Foliola contigua v. subimbricata foliis dimidio v. duplo breviora orbiculata, basi anguste breviter decurrentia ibidemque marginibus valide recurva.

Flores monoici (paroici): ♀ dichotomiales. Bracteæ foliis breviores erectæ complicato-bilobæ, lobo obovato-cuneato acuto obtusove integerrimo v. apice subdenticulato, lobulo minore ligulato lanceolatove; bracteola cuneato-ligulata rotundata.

Perianthia plus minus alte emersa clavato-oblonga rotundato-retusove-truncata brevirostria, subcompressa, antice depressa postice obtuse bicarinata, carinis sæpe approximatis v. etiam in unam confluentibus.

Antheridia solitaria in foliorum bracteas ♀ proxime sequentium—basi paulo magis inflatorum—axillis.

Var. *obliquata*, pallidior, tenerior. Folia prælata valde obliqua, margine antico posticum duplo et ultra excedente, margine postico toto late incurvo unde folia bis complicata videntur; lobulus ante sinum in dentem subulatum protractus. Bracteæ acuminulatæ; bracteola apice recurvo late emarginata sinu lunulari. Perianthia subinflata, postice magis distincte bicarinata.—Ad pedem montis *Tunguragua*, juxta pagos *Baños* et *Puela*.

2. Brachio-Lejeunea securifolia, Spruce.

Hab. Ad pedem Andium Quitensium occidentalem, a cl. Jameson lecta. (“*Phragmicoma corticalis*,” Mitt. in schedis).

F 1·0–·9 × ·8; *lob* ·45 × ·3; *c* $\frac{1}{30}$–$\frac{1}{25}$; *f*^{la} ·5 × ·5; *br* 1·5; *br*^{la} 1·0 × ·4; *per* 1·5 × ·75^{mm}.

Pusilla subcæspitosa flavescens tenella. Caules pollicares iteratim dichotomi, raro etiam subpinnati.

Folia confertiuscula laxe accumbentia concava oblique late obovata, fere securiformia, apice cucullato valde obliquo obtusata rotundatave raro subacuta, basi decurrenti-subsaccata; lobulus 2-plo brevior rhomboideo-rotundus v. subquadratus pauci- (2–3-) crenulatus, ad carinam inflatus, dimidio supero inflexus appressusque; cellulæ iis *L. laxifoliæ* conformes dimidio tamen majores.

Foliola subimbricata foliis duplo breviora cuneato-rotunda raro retusula basi angustâ excisâ penicillum radicellarum proferentia.

Flores monoici: ♀ dichotomiales. Bracteæ foliis dimidio longiores subangustiores acutæ, complicato-bilobæ; lobulus lineari-rhomboideus planus apice abrupto elongatove acutus; bracteola ligulata, apice lato recurvo truncato-rotundata.

Perianthia vix subemersa pyriformi-oblonga apice rotundato-truncato brevi-rostellata, subcompressa, antice unisulca, postice obtuse bicarinata, lævia, rufo-badia.

Amenta ♂ medio caule posita; bracteæ paucijugæ, foliis caulinis continuæ, iisdem paulo breviores, lobulo magis inflato majoresque.

B. L. laxifolia, Tayl. differt statura majore, foliis semicordato-ovatis persæpe apiculatis acuminulatisve laxioribus, distiche patulis (nec lateraliter accumbentibus), foliolis majoribus orbiculatis, perianthiis longioribus clavato-pyriformibus, floribus ♂ perichætium ♀ proxime sequentibus (*i.e.* paroicis). Arcte affines tamen sunt.—*Phragmicoma corticalis* L. et L. longius recedit peranthiis 7-plicatis cæterisque caracteribus.

3. Brachio-Lejeunea bicolor, Mont.

L. bicolor Mont. in D'Orbigny Voy. Crypt. 66. *Phragmicoma b.* Nees in Fl. Bras.; G. L. et N. Syn. Hep. 294.

Hab. In Andium devexis sylvaticis, tam orientalibus quam occidentalibus, alt. 600–2500 m. (*Lamas; Tunguragua; Chimborazo*). *Brasilia*, *Trinidad*, *Mexico* (Syn. Hep.).

F 1·65×1·1 (×1·35, *a lobuli basi mensa*); *lob* ·7 ; *c* $\frac{1}{10}$–$\frac{1}{2\cdot5}$; *f*^{la} ·9×1·15, 1·15×1·15 ; *br* 2·0×1·5 ; *br*^{la} 1·2×1·0 ; *per* 1·5×·75^{mm}.

Elata, fusco- et fulvo-badia, stratificata; caules ascendentes 3–5-pollicares nigricantes parce pinnati et subbipinnati, ramis ♀ pro more dichotomis.

Folia imbricata patentia semicordato-ovata apice decurvo abrupte acuta apiculata v. acuminulata, integerrima v. suprema apice subserrulata, basi caulem paulo transeuntia, subsinuato-complicata; lobulus plus duplo brevior triangularis appressus, basi alte incurrens (cum lobo sacculum compresso-obconicum efformans), margine transverso subconvexo 5-crenulato, crenulis cellulam unicam opacam sistentibus; cellulæ parvulæ subconformes æquilateræ v. parum elongatæ, subconvexæ, pariete ad angulos sat incrassato, utriculo interdum collapso.

Foliola imbricata cuneato-reniformia-orbiculatave, decurrentia, basi ipsa biauriculata, auriculis semicircularibus v. falcato-oblongis conniventibus, margine supero rotundata valideque recurva.

Flores dioici: ♀ dichotomiales. Bracteæ foliis majores bilobæ, vix complicatæ, lobis late oblique ovatis sensim subacuminatis acutis serrulatis ad carinam latiuscule semiovato-alatæ, lobulo duplo breviore intra lobi marginem insidente; bracteola longe brevior obovato-cuneata integerrima, apice rotundato recurvulo.

Perianthia subimmersa oblonga obtusa compressa longirostria, a basi ad $\frac{1}{3}$ alt. lævia, dein ad apicem usque alte 10-plicata, plicis undulatis, rostello e cellulis 6-seriatis constante quasi 6-striato ore subdilatato.

Flores ♂ medio ramo basive positi; bracteæ plurijugæ foliis proximis paulo breviores, lobulo submajore magis inflato; antheridia bina suprapositæ longe stipitata.

Var. *conferta* Syn. Hep. Valde densifolia, caule rufo ; foliis obtusis v. abrupte acutis (nec acuminatis) recte complicatis, lobulo sublongiore ad plicam subinflato; foliolis latioribus brevioribus.—In M. *Lamas*, ad fruticum ramulos.

Var. *Chinantlana*, Gottsch. Mex Leverm. Folia laxe imbricata angustiora sensim longe acutata subacuminatave, basi decurrentia et subsaccata. Foliola longiora basin versus crispula, auriculis majusculis. Bracteæ anguste lobulatæ plerumque explanatæ, dorso plus minus late alatæ; bracteola obovato-ligulata apice lato *emarginato-bifida*, vel etiam ad $\frac{1}{3}$ fissa, sinu triangulari. Perianthia brevius rostellata.—M. *Chimborazo*, e ramulis pendula.—Cum planta Mexicana, l. c. descripta, bene congruit.

Exemplaria typica *L. bicoloris* in hb. Hook., a Swainson in Brasilia lecta, minora sunt, foliis inferioribus obtusis, superioribus solis acutis. Foliola e marginis recurvatione interdum subquadrata videntur, explanata tamen eandem formam habent ac in nostra.

SUBGENUS XV.—*HOMALO-LEJEUNEA*, S.

(= *Marchesinia*, Gray, = *Phragmicoma*, Dumort).

Elata rufescens badiave raro apice virescens. Caules, e caudice brevi repente sæpe cito dissoluto, 2–6-pollicares, suberecti pendulive,

stratificati, iteratim dichotomi; raro basin versus ramo unico, paucisve brevibus suboppositis, interdum masculis subpinnati, fere arhizi.

Folia magna (1·2–2·0^{mm}) plus minus imbricata plana decurvave—raro subsecunda—semicordato-ovata raro rotundata, plerumque acuta acuminulatave, margine apicem versus denticulata vel etiam argute spinoso-dentata—in perpaucis integerrima—basin subdecurrentem versus sinuato-complicata ; lobulus parvus, folio 4–7-plo brevior, basi sæpe subinflatus, cæterum planus appressus, margine transverso sæpe alto rotundato 1–2-denticulato, raro integerrimo, in paucis sp. 4-crenulato; cellulæ mediocres subæquilateræ fere planæ leptodermes subpellucidæ.

Foliola sat magna, foliis subduplo breviora, raro æquimagna, orbiculata reniformiave, basi v. cordata v. decurrentia, margine integerrimo v. toto fere spinuloso. Rhizina rarissima stellato-patula, apice trifida.

Flores dioici vel monoici (autoici et paroici): ♀ dichotomiales. Bracteæ foliis pro more vix æquilongæ, angustiores, profunde bifidæ, lobo superne spinuloso (in unica sp. integerrimo), lobulo parvo integerrimo; bracteola obovata, rotundato-truncata emarginatave, apice saltem, vel tota, argute dentata (in *Mackaii* integerrima).

Perianthia magna v. imo maxima, palæformia v. subobovata, *fere planissima* —facie postica in paucis obscure obtuse unicarinata—apice rotundato-truncato v. sæpius obcordato brevirostellata, margine integerrima repandula raro obsolete alata.

Andrœcia rarius medio caule, foliis caulinis continua, sæpe infra florem fœm., vel in furcarum apice posita ; bracteæ pauci—plurijugæ; antheridia solitaria, raro bina.—Interdum antheridia intra bracteas floris ♀ ipsissimas inventa sunt.

Hab. In arborum ramis, raro ad rupes; omnes fere species Americanæ monticolæ.

Distr. Species 4 Americanas hucusque cognitas, omnes in Andibus æquatorialibus, rarius et vix supra 1800 metra—*L. Bongardianam* ad montium pedem prope Guayaquil—ipse legi. Si pro quinta specie *L. siliculosam* Wils. Mst. habueris, hæc in Columbia solum a PURDIE lecta est. *H. L. palæflora* n. sp. a meipso in M. *Chimborazo* inventa; *H. L. robusta* Mitt., primum a cl. JAMESON lecta, per Andes Quitenses et Peruvianos mihi hic illic obvia fuit. *H. L. Guilleminiana* Mont. et *Bongardiana* L. et L. a Mexico ad Brasiliam usque distributæ sunt.—Species extra-americana insignis est *H. L. Mackaii* Hook., insulis Britannicis haud rara, nuperius etiam in Italia inventa. Species pulchra africana est *H. L. excavata* Mitt., ad fl. Nigrum lecta; asiaticam nullam cognosco.

A. *Foliola integerrima.*

a. *Folia pro more integerrima.* Monoicæ.

1. *Homalo-L. Guilleminiana*, Elata. F. semicordato-ovata, inferiora apice rotundata, superiora acuta, lobulo 4-plo breviore margine 4-dentato, dentibus plerumque opacis. Foliola foliis æquilata, dimidio breviora, orbiculari-reniformia, basi longe decurrentia. Flores ♀ semper dichotomiales ; bracteæ apice denticulatæ ; bracteola late spathulata, apice rotundato spinuloso-denticulata. Per. obovata vel rectangulari-oblonga, planissima, retusa emarginatave.

[*Homalo-L. siticulosa* Wils. Ms. Pusilla. Folia angustiora. Foliola basi subcordata. Bracteola linearis subserrata emarginato-bifida.—*Columbia*].

[*Homalo-L. Mackaii* Hook. F. subsemicordato-ovato-rotunda, omnia obtusissima, lobulo margine sinum versus dentibus 2 opacis aucto. Foliola duplo breviora, basi neque cordata nec decurrentia. Flores ♀ pro more dichotomiales, interdum innovatione unilaterali sola suffulti. Br. integerrimæ. Per. obcordato-obovata.—Insulis Britannicis.]

b. *Folia superne serrata spinosave.* Dioicæ.

2. *Homalo-L. Bongardiana.* Tenella. F. erecto-patula subplana dimidiato-ovato-oblongâ, apiculata apiceque subserrulata, lobulo 6-plo breviore suplano. F^{la} foliis vix duplo breviora, quadrato-orbiculata, sæpe retusula, basi decurrentia. Br. subacuminatæ superne grosse serratæ; br^{la} ovalis emarginato-bifida, dimidio supero serrulata. Per. magna rufa cuneato-obovata retusa longirostria.

3. *Homalo-L. palæflora.* Priore duplo major. F. a basi brevi saccatâ divergentia subplana crispula ovato-oblonga obtusata acuminulatave, superne argute spinoso-dentata, lobulo 6–7-plo breviore inflato. F^{la} foliis vix duplo breviora, cordato-orbiculata ad basin decurrentem sæpe biauriculata. Br. argute spinulosæ; br^{la} longior obovato-cuneata emarginata subduplo spinoso-dentata. Per. palæformia, fere planissima, emarginato-truncata rostellata.

[*Homalo-L. excavata* Mitt. F. decurvo-concava, oblongo-rotunda minute apiculata apice subdenticulata, lobulo plus duplo breviore plano. F^{la} *foliis imo majora*, breviora vero latiora, reniformi-rotunda, recurvo-convexa. Br. foliis subconformes; br^{la} obovato-spathulata brevissime bifida, segmentis apiculatis, toto apice subdentata. Per. obovata rotundata rostellata.—Ad fl. Nigrum Africæ (BARTER).]

B. *Foliola (æque ac folia) spinuloso-denticulata.*

4. *Homalo-L. robusta.* Flores paroici.

1. HOMALO-LEJEUNEA GUILLEMINIANA, M. et N.

Phragmicoma G., Mont. in Annal. Sc. Nat., 1841, p. 128.

Var. *cardiantha*, Spruce. *Hab.* In Andibus Quitensibus ad arborum ramulos, alt. circiter 1500 m., locis *Pallatanga*, *Antombos*, riv. *Chasuán* (Chimborazo), etc.; Brasilia (GUILLEMIN); Venezuela (MORITZ).

F 2·0 × 1·5; *lob* ·5 × ·45; *c* $\frac{1}{3\cdot5}$—$\frac{1}{2\cdot5}$; f^{la} 1·3 × 1·5, 1·1 × 1·3, *ramea* ·75 × ·8; *br. lob* 2·15 × 1·25; br^{la} 1·8 × 1·5; *per* 3·5 × 2·0^{mm}.

Robusta, badia vel e viridi rufa, stratificata, sæpe pendula; caules 3–4-pollicares densifolii, basi prostrata autem denudati, validi nigrescentes superne 2–4-ies dichotomi, angulo dichotomiarum subrecto.

Folia magna imbricata patula, apice decurvo-cucullata, a basi semicordata ovata ovatove-oblonga, inferiora rotundata superiora abrupte acuta (ramea subapiculata) integerrima, subrecte complicata, plica recta angulum 45° cum caule efformante; lobulus 4-plo brevior appressus fere planus subtrapezoideus, apice cum lobo abrupte confluens, margine rotundato 4-dentato, dentibus cellula unica tribusve (opacis sæpeve pellucidis) constantibus; cellulæ mediocres planæ pellucidæ, chlorophyllo parco, trigonis nullis, inferiores sensim majores longioresque, marginales fere duplo majores.

Foliola imbricata, foliis æquilata plus dimidio breviora, orbiculato-reniformia, undulato-retusa, insigniter convexo-recurvula, integerrima, basi longe attenuato-decurrentia, a media basi fere ad apicem usque unisulca, plerumque arhiza. Foliolum infraflorale cæteris majus, orbiculatum subdenticulatum tota longitudine sulcato-carinatum.

Flores monoici et dioici: ♀ terminales in dichotomiis. Bracteæ ramulo novello adnatæ, foliis sublongiores appressæ oblique oblongæ acutæ, apice denticulatæ, ultra ½ bilobæ, lobulo angusto lineari apice libero lanceolato; bracteola paulo brevior late spatulata, apice lato rotundato spinuloso-denticulata, inferne laxe texta.

Perianthia magna, alte emersa, basi rufo-badia apice albida, anguste obovata—alia rectangulari-oblonga—planissima, decurva (ad *Scapaniæ* instar) apice lato obcordato emarginatove brevirostria, margine subincrassato repandulo lævissimo.

Androecia ramulis tenuibus julaceis, ex inferiore caule ortis, constantia; bracteæ pauci-plurijugæ foliis 2-3-plo breviores, lobulo turgido lobo dimidio minore. Antheridia e reliquiis solitaria viderentur.—Plantæ unisexuales frequenter adsunt.

Planta nostra cum descr. 'Synopseos' et Gottschei 'Mex. Leverm. 171,' satis bene congruit, differt autem a speciminibus Montagneanis in hb. Hook. (sine loco natali) caracteribus tanti momenti ut hæc ultima pro diversa specie fere habenda. Quum autem dubius sum, in præsenti varietatem "*apiculata*" appello, a typo diversam statura duplo minore; colore pallidiore; foliis planioribus, *superioribus longius apiculatis apiceque sæpe angulato-denticulatis; lobulo majore* (=fere ½ folii) haud omnino tecto, apice breviter truncato; foliolis fere planis reniformi-spatulatis repandis; bracteola ovali *apice ad* ⅕ *acute bifida*, segmentis acuminulatis serrato-dentatis.

Note.—These specimens of Montagne's are possibly from the original station ("Mt. Corcovado a cl. Guillemin lecta"), yet they differ more from the 'Synopsis Hep.' description than do my own Andine ones. In all the forms the lower stem-leaves are obtuse or even rotundate, the upper acute or apiculate, and the leaves of slender branches have a longer apiculus. My plant differs from the description in 'Syn. Hep.' chiefly in the obcordate, or emarginate perianth; and from Montagne's plant by the broad entire (not bifid) bracteole.*

2. HOMALO-LEJEUNEA BONGARDIANA, L. et Lindenb.

Syn. Hep. 318; Phragmicoma B., Lindenb. op. cit. 740. *Homalo-L. Radula*, Spruce Mst.

Hab. Ventanas prope *Guayaquil*, in Cacao ramis.

F 1·2 × ·8, ·9 × ·5, *lob* ·2, *c* $\frac{1}{32}$; *f*^{la} ·75 × ·75, ·65 × ·65, ·5 × ·4 (*ramea*); *br* 1·2 × ·65, 1·2 × ·75; *br*^{la} 1·15 × ·8, 1·15 × ·7; *per* 2·5 × 1·4^{mm}.

Tenella pulchella, pallide viridis, caulibus badiis, perianthiis magnis rufis.

* *Homalo-Lejeunea siliculosa*, Wils. in hb. Hook. (sub *Jung.*), ad Salanga Columbiæ, a Purdie, anno 1836, lecta, ad *Phr. Guillemin*ianam a cel. Taylor relata, mihi diversa videtur; statura pusilla; foliis angustioribus, magis dissitis, ad lobulum solum imbricatis, lobulo minore tecto; foliolis subrotundis repandis, basi subcordatis, vel hinc semicordatis, hinc breviter decurrentibus (nec utrinque longe decurrentibus ac in L. Guilleminiana); demum bracteola lineari subserrata apice emarginato-bifida.

Caules $\frac{1}{2}$–2-pollicares erecti pendulive bis terve dichotomi (angulo subrecto), laxe stratificati.

Folia laxe subimbricata, erecto-patula, fere plana, semicordato-ovato-oblonga, basi antica dilatata subsemicordata, apice apiculata acuminulatave et plus minus serrulata (dentibus pro more 3–4), basi postica subdecurrente recte complicata; lobulus minutus folio 6-ies brevior linearis subplanus subintegerrimus; cellulæ $\frac{1}{32}$ mm. subconformes chlorophyllosæ subpellucidæ.

Foliola dissita, superiora sola contigua v. subimbricata majoraque, foliis vix duplo breviora quadrato-orbiculata, apice undulata sæpe retusula, basi profunde excavato-decurrentia, raro ibidem in lobulos breves obtusos liberos producta.

Fl. dioici: ♀ terminales in dichotomiis; bracteæ patulæ foliis æquilongæ paulo angustiores subacuminatæ acutæ supra medium grosse serratæ, ad $\frac{3}{4}$ bifidæ, plica angusta sublinearis apice elongato-acuta; bracteola subæquimagna ovalis v. ovali-lanceolata, apice recurvo emarginato-bifida, sinu triangulari, segmentis apiculatis, a medio serrulata.

Perianthia magna foliis 2-plo et ultra longiora, rufa, cuneato-obovata, complanata, ex apice lato retuso longius rostellata, antice planissima, postice obsolete carinata fere plana, margine integerrima parum angulata, demum bilabiata. Calyptra = per $\frac{2}{3}$, subpyriformis (a basi ad medium angusta, teres, dein subabrupte dilatata, ovalis) valida, e cell. stratis 2 confecta, demum apice triloba, lobulo medio minore. Capsula pallida majuscula, in pedicello longiusculo corrugato exserta profunde 4-fida, valvulis recurvulis 5–6 striatis apicem versus elateribus longis obsitis.

3. HOMALO-LEJEUNEA PALÆFLORA, Spruce (TAB. IV.).

Hab. In Andibus Quitensibus sylvaticis, alt. circiter 1500^{m}, e ramis pendula, devexu occidentali in monte *Chimborazo*, orientali ad *Antombos* juxta fl. *Pastasa*.

F 2·25 × 1·35 (lata ad lobuli apicem), *lob* ·35, *c* $\frac{1}{2\frac{1}{5}}$; *f*^{la} 1·25 × 1·2, 1·35 × 1·35; *br* 2·0 × 1·0; *br*^{la} 2·4 × 1·8; *per* 4·0 × 2·0^{mm}.

Elata pallida, e viridi rufula. Caules 4–6-pollicares iteratim dichotomi, angulo furcarum subrecto.

Folia subplano-disticha perpaulo imbricata, siccando crispula et quasi dissita, sublongitudinaliter inserta, basi brevi spatio saccata suberecta, dein abrupte subdivaricata (infra lineam horizontalem divergentia) semicordata-ovato-oblonga obtusata vel abrupte acuminulata, superne argute spinoso-dentata, dente uno alterove apicali sæpe longe majore; lobulus 6–7-plo brevior semioblongus subinflatus, margine transverso subrotundato sinum versus obscure unidentatus; cellulæ mediocres pellucidæ leptodermes subconformes.

Foliola foliis fere æquilata, vix duplo breviora, subcontigua, cordato-orbiculata repandula integerrima fere planissima, basi profunde excavata pro more in auriculas parvulas subcirculares lunatasve deorsum producta.

Flores dioici (?): ♀ dichotomiales. Bracteæ foliis minores profunde bifidæ, semiovali-lanceolatæ subacuminatæ argute spinulosæ, lobulo parvo angusto rhomboideo, vel lineari in apicem subulatum producto, integerrimo; *bracteola bracteis longior*, obovato-cuneata, late emarginata, profunde et subduplo spinoso-dentata. Foliolum infraflorale

cæteris caulinis multo majus, orbiculatum, toto fere margine spinuloso denticulatum.

Perianthia alte emersa, foliis fere duplo longiora, palæformia, (a basi brevi triangulari rectangularia), fere planissima, postice obscure convexula, apice emarginata-truncata rostellata, margine apicem versus nonnunquam obsolete alata, lævissima.

Andræcia nulla invenire potui.

A *L. robusta*, Mitt. differt floribus dioicis; foliis laxe imbricatis, apice argute spinosis, lobulo multo minore; præcipue autem foliolis integerrimis, ipsa basi decurrente biauriculatis, i.e. cordatis.

Ad Antombos adest forma pallide viridis laxa, foliis plane dissitis apice pauciserratis, lobulis minutis interdum subobsoletis; foliolis hinc auriculatis, hinc longe sensim decurrentibus, auricula nulla.

Obs. Where the plants cross one another, or an intermixed hepatic or moss, the underleaf puts forth at the crossing a many-rayed star of radicles, each split at the top into about three papillæ, which adhere closely to the object they overlie; but unless the stems come into contact with anything they emit no radicles, although the brownish hilum at the middle base of the under leaf is always present, and is doubtless ready to exert its root-bearing function whenever required.

4. HOMALO-LEJEUNEA ROBUSTA, Mitt.

In Hook. Journ. Bot. (1851).

Hab. In Andibus Peruvianis et Quitensibus, alt. 1200–2500^{m}, ad saxa arboresque; *Pichincha*, in descensu occidentali, ubi primum invenit JAMESON, postea ipse legi, et in monte *Campana*, ad pedem m. *Tunguragua* juxta *Baños*, etc.

F 1·9×1·5, *lob* ·4, *c* $\frac{1}{2\frac{1}{4}}$; f^{la} ·8 (*a media basi*, 1·1 *ab angulo decurrente*) ×1·1; *br* 1·8×1·05; br^{la} 1·8×1·35; *per* 3·0–4·0×1·7^{mm}.

Elata badia stratificata. Caules 3–6-pollicares validi parce dichotomi vel brachiatim divisi—steriles interdum pinnati, ramis paucis brevibus suboppositis.

Folia conferta—plus quam dimidio imbricata—sæpe ad Mastigobryi instar disticho-deflexa, a basi complicatâ suberectâ ad lobuli apicem abrupte divergentia, semicordato-ovata, truncata, acuta vel (superiora) apiculata acuminulatave, margine postico toto fere, antico apicem versus, spinuloso-denticulata, basin versus sinuato-complicata; lobulus 5-plo brevior subplanus semi-obparabolicus, margine transverso repando vel bidenticulato; cellulæ majusculæ æquilateræ pellucidæ, pariete tenui.

Foliola duplo fere breviora late imbricata, late orbiculata, vel cuneato-orbiculata, basi brevius longiusve decurrentia ibidemque crispula—interdum hinc parviauriculata, toto margine (basi excepta) spinuloso-denticulata lateque recurva.

Flores monoici (autoici et paroici): ♀ terminales, innovationibus duabus oppositis suffulti. Bracteæ foliis caulinis vix breviores ab apice ad $\frac{3}{4}$ alt. bifidæ, lobo oblique lanceolato subacuminato superne subdenticulato, lobulo minuto rhomboideo apiculato; bracteola magna obovato-cuneata subtruncata vel late emarginata, margine toto fere argute spinulosa; omnes bracteæ basi macula magna flavida notatæ.

Perianthia maxima, foliis duplo longiora, fulva, a basi brevicuncata rectangulari-oblonga, valde compressa, fere plana, ex apice emarginato longirostria demum bilabiata, margine repandulo lævi.

Andrœcia vel ramulum terminantia, flore ♀ in ipso apice nullove, bracteis ♂ 2–4-jugis, vel in medio caule posita, bracteis plurijugis foliis consecutivis. Bracteæ basi naviculares subturgidæ ultra ½ bifidæ, lobulo lobo duplo breviore ovato-lingulato acuto. Antheridia magna, singula, raro binata.

Obs. In specimens gathered on Pichincha the very apex of both stem and branches is minutely bifid, with a monogynous ♀ flower in the fork. The next 2 or 3 pairs of leaves below the ♀ bracts contain antheridia—solitary, rarely twin; and very rarely a solitary abortive antheridium occurs in the axil of each ♀ bract. The branchlets of each fork finally lengthen out and flower at the apex, like the first branches.

SUBGENUS XVI.—*DICRANO-LEJEUNEA*, S.

Caules e caudice prostrato tenui ramoso, cito dissoluto, ascendentes pendulive cæspitosi elatiusculi (1–4-pollicares) graciles flexuosi, fere arhizi, pinnati, pinnis alternis distantibus—hinc sæpe pro parte deficientibus—superioribus iteratim dichotomis, flore ♀ in furcis.

Folia majuscula (·75–1·6mm.) parum imbricata decurva, siccando involuta, semicordato-ovata, subtriangularia, acuta, apice argute paucidentata-serratave, raro integerrima, ad plicam decurrentia; lobulus (=$\frac{1}{5}$–$\frac{1}{2}$ folii) inflatus, margine sæpius unidenticulatus, apice v. dentiformi v. confluente; cellulæ mediocres parvulæve pachydermes pellucidæ, utriculo pro more collapso.

Foliola foliis subduplo breviora—in unica sp. fere æquimagna—oblonga, rotunda, reniformiave, decurrentia integerrima, radicellas fasciatas apice subdivergentes (nec in orbem radiantes) perraro proferentia.

Flores monoici (paroici)—interdum dioici (?): ♀ dichotomiales. Bracteæ foliis raro longiores, lanceolatæ acutæ spinulosæ ciliatæve, minutissime (vel non) lobulatæ—in unica sp. lobulo magis distincto, carina alata; bracteola latior, longius ciliata, apice integra v. emarginato-truncata.

Perianthia emersa obcordata compressa brevirostria, margine alata ciliataque, postice late obtuse unicarinata, vel rarissime carinis 2 subspinosis percursa. [Perianthium revera in dorso primitus *bicarinatum* est, carinis obtusis basi haud longe dissitis, superne conniventibus, apiceque confluente 1-(raro pluri-) spinis inermibusve, fructu autem maturato, obsoletis, indeque perianthium dorso alte convexum ecarinatum videtur.] Calyptra perianthio fere duplo brevior pyriformis tenuis rufula, ultra medium in valvulas 3 regulares, tertia paulo latiore, fissa. Capsula globosa tenuis pellucida, ultra ½ quadrivalvis, cellulis bistratis, externis magnis quadrato-hexagonis, internis intus nodosis sæpe ex parte dissolutis. Elateres pauci subapicales, cujusque valvulæ sub 6 (utrinque 3), e cellulis valvularum marginalibus, cæteris duplo minoribus quadratis, orti, prælongi, capsula haud multo breviores, unispiri, apice lato truncati.

Andrœcia hypogyna; bracteæ foliis rami fertilis parum mutatis constantes, monandræ.

Cum *Odonto-Lejeunea* convenit perianthiis obcordatis, ala ciliata spinosave marginatis, et foliis dentatis; certe tamen distat caulibus a matrice liberis cæspitosis; foliis decurvis in sicco involutis solum apicem versus (nec toto fere margine) dentato-serratis, lobulo turgidiore; foliolis semper integerrimis, radicellis (perraris) penicillatis, nec in discum expansis; florescentia paroica; floribus ♀ constanter dichotomialibus; bracteis ♂ foliis conformes monandris (nec multo minoribus diandris, ac in *Odonto-Lejeunea*).

Hab. Ad arborum ramulos, rarius ad rupes vel in ipsa terra sub fruticum umbra, in regione Andium Aequatorialium media sylvatica, inter 1000 et 2500 m. alt.

Distr. Subgenus extra Andium juga, a Mexico ad Boliviam usque, adhuc haud visum, speciebus sub 7 constat, quarum 4 (3 novas) ipse legi.

A. *Foliola foliis subduplo minora. Folia patentia.*

a. *Foliola longiora quam lata. Perianthia margine alato pauci-longiciliata.*

1. *Dicrano-L. axillaris.* Per. dorso late unicarinata subinermia.
2. *Dicrano-L. hypoacantha.* Per. dorso bicarinata, carinis inciso-ciliatis.

b. *Foliola latiora quam longa. Per. ad alam crebre breviuscule ciliata, dorso alte carinata inermia.*

3. *Dicrano-L. ciliatiflora.*

B. *Foliola foliis fere æquimagna reniformia. Folia supra lobulum divergentia-devoluta.*

4. *Dicrano-L. circinnata.* Per exalata, apice minute pauciciliata, fere complanata, dorso inermia.

1. DICRANO-LEJEUNEA AXILLARIS, Mont.

Ann. des Sc. Nat. 2 Ser. V. p. 59.

Hab. In Andium Aequatorialium devexis sylvaticis, tam orientalibus quam occidentalibus, in sylva *Canelos*, super montes *Tunguragua*, *Chimborazo*, *Azuay*, etc., alt. 1000–2500 m., ad arborum ramulos rarius ad rupes. Peruvia (Hb. Mus. Par.). Mexico (LEIBOLD).

F 1·1 × ·9, ·75 × ·5; *lob* ·3; *c* $\frac{1}{10}$; *f*^{la} ·6 × ·35, ·5 × ·3; *br* ·8 × ·4; *br*^{la} ·65 × ·45; *per* 1·9 × 1·2, 1·5 × 1·2, 1·2 × 1·0^{mm}.

Elata cæspitosa erecta pendulave rufo-badia-fulvave. Caules 2–4-pollicares flaccidi pinnati, ramis distantibus superioribus iteratim dichotomis.

Folia contigua vel subimbricata, a basi turgidâ plicatâ suberectâ patentia, semicordato-ovata, sæpe fere dimidiata vel subtriangularia, apice valde decurvo (in sicco convoluto) argute 3-vel paucidentata; lobulus subtriplo brevior ovatus, convexo-saccatus, margine unidentato apiceque triangulari incurvus; cellulæ parvulæ æquilateræ, pariete ad angulos (rarius etiam ad media latera) incrassato, utriculo persæpe collapso, pellucidæ.

Foliola foliis vix duplo breviora, oblonga rotundata retusulave, decurrentia, media basi dorso mammillâ, interdum glutinosâ, raro radicellas fasciculatas, proferente, prædita, alis recurvis.

Flores monoici: ♀ dichotomiales (primum terminales, innovationibus

duabus valde rudimentariis suffulti). Bracteæ foliis subbreviores planæ lanceolatæ, altera elobulata, altera lobulo dentiformi inflexo aucta, bracteolaque oblonga supra medium dentato-spinosæ-ciliatæve.

Perianthia foliis longiora, basi anguste cuneata plus minus elongata, dein obovata, apice obcordata medio mammillata, compressa, margine alata, ala supra medium laciniato-ciliata, sine ciliis 1–4 cell. lata; ciliis utrinque 7–10, 4–8 cell. longis, inferne c. 2, superne 1, latis, varie hamatis; antice subplana, postice convexo-carinata (revera obtuse bicarinata, carinis approximatis superne conniventibus) apiceque vel nudo vel cilio uno alterove auctis. Calyptra pyriformis tenuis. Capsula globosa.

Antheridia in ramorum ♀ foliorum præcipue superiorum axillis solitaria magna globosa longistipitata. Folia (s. bracteæ) cæteris foliis caulinis haud diversa vel solum basi paulo magis ventricosa.

In the lobules, and sometimes in the perianth, are occasionally found from 1 to 3 orbicular lens-shaped bodies the size of the antheridia but whitish and opaque. They have a minute marginal umbo, but no stalk.

2. DICRANO-LEJEUNEA HYPOACANTHA, Spruce.

Hab. In sylvis Andium Quitensium occidentalibus ad *Pallatanga*, alt. 2000 m.: ramicola.

F 1·1 × ·8; *lob* ·25; *c* $\frac{1}{3\cdot5}$; f^{la} ·5 × ·35; *br* 1·0 × ·5; br^{la} 1·0 × ·6; *per* 1·5 × 1·0^{mm}. (*ciliis inclusis*).

L. axillari affinis, differt colore virescente; foliis abrupte acutis obtusisve apicem versus (raro toto fere margine) inæqualiter serratis (dentibus 5–8), plica cum margine postico fere recte continua, lobulo angustiore integerrimo in lobum sensim transeunte; foliolis subminoribus; involucris florum ♀ interdum solitariis nec oppositis; præcipue autem perianthiis basi brevissime angustatis, margine fere a basi longiciliatis, postice bicarinatis, carinis (vel saltem altera) ala inciso-ciliata auctis.

Obs. The perianth furnished with *two* winged and ciliated keels at the back makes this plant seem, at first sight, very different from *L. axillaris*, whose perianth has only one broad and usually unarmed keel underneath; but in reality this one keel arises from the confluence, in mature and postmature perianths, of two obtuse keels, standing not very widely apart below and uniting above, a little below the apex of the perianth, where they are usually armed with a single spine or cilium; and (very rarely indeed) one of these keels will have two or three additional subapical spines.—The narrower and less saccate lobules may arise from the fact that hypogynous antheridia are much rarer in *L. hypoacantha*, although the inflorescence is the same as in *L. axillaris*. A form of the latter from Mt. Azuay, with normal perianths, has the leaf-lobule almost as in *L. hypoacantha*, but the marginal teeth are fewer, larger, and sharper.

3. DICRANO-LEJEUNEA CILIATIFLORA, Spruce.

Hab. In monte *Tunguragua*, alt. 2400^{m} super arborum ramulos.

F 1·4 × ·2, *lob* ·3, *c* $\frac{1}{3\cdot5}$; f^{la} ·75 × ·85; *br* 1·25 × ·9; br^{la} 1·1 × 1·1; *per* 2·1 × 1·44^{mm}.

Badia, sat robusta; caules 1-2-pollicares, basi sola matrici adfixi, dein

liberi, patuli pendulive, distanter pinnati, ramis brevibus semel vel iteratim prolifero-dichotomis.

Folia paulo (vix ad ¼) imbricata, subdivergentia, late suboblique semicordato-ovata, subtriangularia, apice decurvo apiculato-acuta ibidemque pauci-serrulata vel integerrima, supra basin posticam valde sinuato-complicata; lobulus 5-plo brevior, decurrens saccatus oblique compresso-obconicus, margine transverso subplano sinum versus grosse bidenticulatus; cellulæ subpellucidæ, chlorophyllo in annulum congesto, subconformes, mediocres, folii apicem et marginem anticum versus minores, subbasales laxiores.

Foliola imbricata dimidium folium parum excedentia, orbiculata, paulo latiora quam longa, alis a media basi (ubi radicellæ affixæ sunt) longe supra caulem decurrentibus, basi ipsa rotundatis cordatisve, margine supero recurvula.

Flores monoici: ♀ in dichotomia terminales; bracteæ foliis subbreviores appressæ, sese late imbricantes, ovales (fere symmetricæ) acutæ superne plus minus serrulatæ subspinulosæve [lobulo ad processum minutum subulatum, 4 cellulas longum 1–2-cell. latum, lobo basi intra marginem adnatum, redacto]; bracteola orbiculata subspathulata medio concava alis plus minus recurvula, integerrima.

Perianthia alte emersa, foliis caulinis multo longiora, obcordato-pyriformi-oblonga rostellata, antice profunde unisulca, postice alte obtuse 1-carinata, margine alâ supra medium (raro fere ab ipsa basi) crebre breviuscule ciliatâ cincta, carina postica lævi. (Ala sine ciliis 3 cell. lata; cilia 3-6 c. longa, basi 2 c. superne 1 c. lata).

Flores autoici et paroici; androecia vel in ramulo subflorali terminalia, vel infra bracteas floris ♀ posita; bracteæ ♂ paucijugæ, foliis vix diversæ, solum lobulo turgidiore. Antheridia solitaria magna.

Pulchra species! a *L. Cipaconea* Gottsche (in N. Granata lecta) diversissima. *L. Mexicana* Lindenb. Syn. H. 325, subsimilis folia habet acuminata semper integerrima, et perianthia parum armata.

4. DICRANO-LEJEUNEA CIRCINNATA, Spruce.

Hab. Tunguragua, ad terram inter Ericeas, alt. 2500^{m}.

F 1·6 × 1·05 (*vel* × 1·55 *cum lobulo*), 1·2 × ·75 (v. × 1·2); *lob.* 65; *c* $\frac{1}{28}$—$\frac{1}{25}$; *f*^{la} 1·1 × 1·4, ·85 × 1·05; *br* 2·0 × 1·1; *br*^{la} 1·5 × 1·0; *per* 2·0 × 1·5^{mm}.

Cespites elati densissimi, pallidi badiive, siccando fuscescentes; caules 3–6-pollicares, suberecti, flexuosi, arcte fastigiati, parce pinnati, ramis brevibus alternis dissitis, fertilibus furcatis.

Folia tenuia tenera imbricata, e basi semierecta, angulo recto divergentia, valde devoluta, circinnatave, semicordato-ovato-oblonga, subtriangularia, acuta, superiora acuminulata, sæpe apiculata v. apice denticulis 3–5 serrulata, infra medium sinuato-complicata; lobulus folio plus duplo brevior, ovalis, compresso-saccatus, subplanus, basi longitudinali cauli incurrens, margine obliquo integerrimo v. sæpius (sinum versus) denticulo cellulam unicam opacam sistente auctus; cellulæ mediocres pellucidæ intus annulo chlorophylli tenui cinctæ, membranâ secundariâ conspicuâ, trigonis majusculis.

Foliola foliis subæquimagna imbricata reniformi-orbiculata, mediâ basi altiuscule excavata (decurrentia), ad latera valde incurva caulem

amplexantia basique rotundata plicato-crispa, apice lato tamen angustissime recurvula, margine toto cellulis parvis quadratis limbata, angulata integerrima.

Fl. dioici: ♀ terminales, e rami dichotomia. Bracteæ foliis longiores, ad $\frac{3}{4}$ usque complicato-bilobæ, ad carinam rectam alâ fere semicirculari auctæ; lobi oblique lanceolati acuminulati superne sparse denticulati; lobuli duplo breviores angustioresque rhomboidei acuti; bracteola bracteis paulo brevior, ovalis, apice rotundato grosse serrata.

Perianthia vix emersa obovata subobcordata obscure rostellata fere complanata, postice parum convexa inermia, margine infra apicem ciliis paucis (utrinque 4-6), minutis, 3-4 c. longis, sparse obsita.

Adveniunt in altero cespite plantæ graciliores magis ramosæ, aliis ramis brevioribus julaceis, foliis lobulo turgidiore instructis, antheridiis autem orbatis, anne igitur masculæ?

SUBGENUS XVII.—*ODONTO-LEJEUNEA*, S.

Plantæ speciosæ, sat elatæ v. pusillæ, prostratæ et radicellis suis, in haustoria disciformia radiatis, arcte repentes, flaccidæ rufo-badiæ, raro in pusillis albicantes, vage ramosæ, raro subpinnatæ, ramis inæquilongis interdum assurgentibus.

Folia magna—in speciebus etiam pusillis sæpe majuscula—0·5–2·0^{mm} longa, laxiuscule imbricata, plana undulatave, in sicco sæpissime recurva, in paucis crispata, subdimidiata subfalcata, paulo longiora quam lata, in majoribus pro m. late obtusa, in pusillis sæpe subacuminata, margine toto (v. ex parte) argute spinoso-dentata, vel saltem (in pusillis) muricato-serrulata; lobulus = folii $\frac{1}{5}$–$\frac{1}{3}$, raro minutus, rarissime subobsoletus, subplanus raro involutus, margine v. integerrimo v. denticulato, dentibus interdum cellula unica opaca terminatis; cellulæ mediocres v. parvulæ ($\frac{1}{15}$–$\frac{1}{25}^{mm}$) subconformes subplanæ, pariete ad angulos interdum etiam ad media latera incrassato.

Foliola foliis 2–3-plo minora, sæpius orbiculata, apice rotundato integra, raro emarginato-truncata, in unica *L. Peruviana* integra sæpiusque bifida in eadem stirpe, fere semper dentata, in paucis utrinque sagitato-hastatove-spinosa, haustoria disciformia basi proferentia.

Flores dioici—in unica sp. monoici: ♀ in caule ramove terminales, innovatione (sæpe prolifera) suffulti. Bracteæ foliis minores angustiores, lobulo minuto nullove; bracteola lata apice rotundata, raro subemarginata—solum in *L. Peruviana* interdum bifida; omnes ad foliorum instar sæpissime dentatæ.

Perianthia plus minus alte emersa, cuneata v. obtriangularia, apice lato fere semper profunde obcordata—raro solum truncata retusave—rostellata, valde compressa, postice lata unicarinata, margine toto vel saltem dimidio supero alata, ala vel spinoso-dentata vel (in pusillis) denticulata spinulosave.

Amenta ♂ ramulum totum vel ejus apicem solum tenentia, tenuiuscula; bracteæ pauci-plurijugæ laxiusculæ diandræ.

Hab. In arborum præcipueque Palmarum humiliorum foliis vivis, sæpe etiam in filicibus, vix unquam in corticibus saxisque.

Distr. In sylvis Amazonicis et Andinis ad alt. 2500^{m}. usque sat frequenter occurrunt, speciesque 10 legi; aliæ in insulis Antillis et Guiana inventæ sunt; nulla species (quantum scio) Asiatica adest, 1 autem Africana (*L. tortuosa* L. et L.) et 1 (L. *Sieberiana* G.) in Mauritii insula.

A. *Foliola integra—in unica specie truncato-emarginata.*

§ *Folia margine dentibus magnis paucis, sinubus pro more lunulatis, armata. Bracteæ subelobulatæ.*

a. *Foliola basi cordata sagittatave, margine plerumque dentata.—Plantæ elatiores.*

a′. *Flores dioici.*

1. *Odonto-L. lunulata.* Rufo-badia flaccida siccando crispa vage ramosa. F. semiovata subfalcata rotundata—raro spinoso-acuta—toto ambitu spinoso-dentata, dentibus posticis paucioribus (sub 4) majoribus, sinubus valde excisis, margine postico incurva basinque versus complicata; lobulus 3–5-plo minor ovato-quadratus, ad plicam convexo-saccatus, margine plano, apice subintegerrimo. Foliola f. 3–4-plo minora orbiculata basi subcordata vel rudimentarie hastata, apice denticulata basin versus spinulosa. Br. f. duplo minores ovato-ovales acutæ dentatæ basi obsolete complicatæ; bracteola late elliptica dentata. Per f. subbreviora obcordata brevissime rostellata, toto margine late alata, ala crebre inciso-spinosa. Andr. longispica.—Var. *angustiflora*, subminor, valde innovando-prolifera, foliis magis æquidentatis, perianthiis prælongis apice parum emarginatis.

2. *Odonto-L. calcarata.* Subpinnatim ramosa siccando crispa. F. divergentia subdimidiato-ovato-oblonga rotundata, superiora subacuta, margine fere toto subæqualiter serrato-vel spinuloso-dentata, sinuato-complicata, plica recta transversa folio 4-plo breviore; lobulus subplanus appressus tectus ovato-trapezoideus apice acuminulatus vel exciso-2–3-dentatus. Foliola subduplo breviora cuneato-rotunda, basi prælonge sagittata margine toto dentata spinosave. Br. foliis multo minores ovatæ acutæ spinulosæ basi minute sinuato-complicatæ; bracteola subrotunda spinulosa. Per. alte emersa cuneato-oblonga, truncato-rotundata vix obcordata, longirostria, rostello apice spinuloso, margine late alata, ala arcte ciliato-spinosa.

3. *Odonto-L. rhomalea.* Robusta inæqualiter ramosa, aliis ramis assurgentibus, siccando crispatissima. F. arcte imbricata rotundata, margine toto æqualiter spinuloso-denticulata sinuato-complicata; lobulus 3-plo brevior triangulari-ovatus subacutus crenulatus, crenulis cellulam unicam opacam sistentibus. Foliola plus duplo breviora cuneato-reniformia apice lato integerrimâ, basi utrinque minus longe sagittata spinoso-paucidentataque.

a″. *Flores monoici.*

4. *Odonto-L. chærophylla.* Majuscula inæqualiter bipinnata. F. laxe imbricata patentia oblique ovata rotundata dentata subrecte complicata; lobulus fere 3-plo brevior decurrenti-saccatus, apice plano 3-dentato. Foliola f. vix 3-plo minora cordato-orbiculata integerrima v. subdenticulata. Br. parvæ ovales acutæ dentatæ obsolete lobulatæ; bracteola ovali-rotunda valde concava integerrima. Per. f. vix breviora cuneato-oblonga subemarginata, postice altiuscule carinata, margine (basi excepta) ala angusta spinuloso-denticulata cincta.

b. *Foliola basi rotundata decurrentiave, integerrima. Species humiliores, grandifoliæ tamen, omnes dioicæ.*

5. *Odonto-L.* 10-*dentata.* Rufo-badia subpinnata. F. subcontigua oblongo-rotunda antice apiceque argute spinuloso-dentata, dentibus sub 10, lobulo nullo v. perparvo. Foliola 3-plo minora subspathulato-rotunda. Br. laxæ foliis vix diversæ; bracteola oblonga truncato-rotundata. Per foliis dimidio longiora obcordato-triangularia, margine superiore alata, ala spinis longis utrinque 8–10 armata.

6. *Odonto-L. hapalochroa.* Pallida tenerrima subramosa. F. late semiovato-oblonga rotundata, superne angulato-dentata, dentibus paucis (sub 5) recte complicata, lobulo 3-plo breviore incurvo. Foliola 3-plo breviora orbiculata. Br. foliis minores semiobovatæ denticulatæ elobulatæ; bracteola obovato-rotunda. Per. cuneata truncata retusulave, apicem versus alata, ala utrinque 3-laciniata.

§ 2. *Folia angustiora e cellulis marginalibus prominulis muricato-serrulata, nunquam valide dentata. Bracteæ (altera saltem) lobulatæ. Plantæ pusillæ dioicæ.*

7. *Odonto-L. Surinamensis.* Albescens crebre subpinnata æqualiter foliosa. F. imbricata semicordato-ovata falcata abrupte acuta minute denticulata et (ramea præcipue) muricato-serrulata, lobulo 4–5-plo breviore inflato. Foliola 3-plo minora squarroso-recurva orbiculato-reniformia integerrima. Br. f. breviores semiobovato-lanceolatæ acutæ serrulatæ parvi-lobulatæ, bracteola obovato-rotunda retusula. Per. longe obcordato-obconica valde compressa, margine superne complanato spinulosa vel fere inermia.

8. *Odonto-L. stachyclada.* Rufo-badia vage ramosa, aliis ramis brevibus aliis elongatis parvi-confertifoliis. F. subcontigua plana subfalcata semioblonga vel semicordato-ovato-oblonga acuta obtusave raro acuminulata, badio-marginata, submuriculato-denticulata v. fere integerrima, lobulo minuto involuto; ramorum spicæformium minora conferta ovato-lanceolata magis denticulata. Foliola 4–5-plo minora reniformia vel subquadrata rotundato-truncata, raro obcordata, integerrima. Br. foliis subminores ovales acutæ serrulatæ, altera lobulata; bracteola obovato-obcordatove-orbiculata. Per. emersa cuneata late truncata, margine supero paucispinulosa v. subinermia.

9. *Odonto-L. truncatula.* Rufo-badia cæspitosa, subpinnatim ramosa, ramis apice circinatis. F. subimbricata decurvo-falcata semiovato-lanceolata acuta acuminulatave argute muricato-serrulata, lobulo plus duplo breviore convoluto. Foliola inferiora parva, superiora increscentia ½ fol. subæquantia, squarrosa, subquadrata, apice lato exciso-truncata integerrima vel secus flores ♀ denticulata. Br. foliis subæquales spinulosæ, altera elobulata; bracteola suborbiculata cochleata integerrima. Per. obcordato-spatulata profunde emarginata, margine subintegerrima.

B. *Foliola pro more distincte bifida.*

10. *Odonto-L. Peruviana.* Dioica rufo-badia, longe repens subbipinnata. F. subimbricata subfalcato-semiovata rotundata subacutave, margine antico apiceque spinuloso-denticulata, lobulo triplo minore transverso ovato-trapezoideo inflato. Foliola inferiora parva, superiora increscentia orbiculata recurvo-cochleata denticulata, ad $\frac{1}{6}$–$\frac{1}{4}$ (raro ad ½ usque) bifida, rarissime integra. Br. foliis multo minores lanceolatæ serrulatæ brevilobulatæ; bracteola ovalis denticulata bifida in-

tegrave. Per. obcordato-triangularia valde compressa supra medium anguste serrulato-alata. Andr. longispica.

1. ODONTO-LEJEUNEA LUNULATA, Web.

Jung. lunulata, Web. Prodr. 33. *Lejeunea l.* G. L. et N. Syn. Hep. 336.

Hab. In sylva Amazonica, ad folia viva, haud infrequens; *Tauaú* prope *Pará; San Carlos* et *San Gabriel* fl. *Negro*, etc. Per Americam tropicam sylvis calidis dispersa, a Mexico et Antillis ad Brasiliam australem.

F 1·4 × ·9, *lob* 3, *c* $\frac{1}{3}$/$_6$; *f*^{la} ·55 × ·6, ·35 × ·35; *br* ·75; *br*^{la} ·7 × ·5; *per* 1·15 × 1·05 (*spinis inclusis*) 1·1 × ·9^{mm}.

Majuscula rufo-badia arcte repens, siccando e foliis recurvis valde crispa. Caules $\frac{1}{2}$–2-pollicares vage ramosi.

Folia subimbricata plana vel sæpius subtortilia crispulave, semiovata acinaciformia plerumque rotundata, toto ambitu grossiuscule spinoso-dentata—dentibus posticis paucis, sub 4, sinubus latis profundis, medio præcipue, anticis crebrioribus minoribus—margine postico incurva basinque versus complicata; lobulus 5-plo brevior subquadratus ovatusve subsaccatus (ad plicam rotundatus), margine applanatus sinumque versus vel truncatus vel obsolete dentatus vel denique sensim in lobum majorem transiens; cellulæ mediocres subconformes æquilateræ pellucidæ.

Foliola foliis 3–4-plo breviora orbiculata, basi breviter sinuato-decurrentia, rarissime cordata vel rudimentarie hastata sagittatave, margine pauci-denticulata, plana vel recurvo-convexa.

Flores dioici: ♀ in ramo terminales, innovatione sæpe prolifera suffulti. Bracteæ foliis duplo minores ovato-ovales acutæ dentatæ, basi minute inflexæ vel non; bracteola late elliptica, medio concava, margine explanata dentata.

Perianthia foliis caulinis subbreviora, late obcordata, brevissime rostellata, compressa, postice obtuse carinata, toto margine late alata, alâ crebre spinosâ incisâve, spinis exclusis 5 cellulas latâ.

Andrœcia ramum totum vel solum ejus apicem tenentia; bracteæ plurijugæ laxiusculæ, ovatæ, a basi ad $\frac{3}{4}$ alt. convoluto-complicatæ, margine dentatæ, lobulo in lobum sensim transeunte.

Obs. The postical margin of the leaves has usually only four teeth, and the gap between the second and third tooth is so wide and deep—extending to nearly one-third the length of the leaf—that it looks as if a piece had been cut out artificially.

Var. *angustiflora* (Odonto-*L. angustiflora*, S. Mst.). A typo differt ramis pluries innovando-proliferis; foliis duplo fere brevioribus (·85 × ·6^{mm}.) oblique oblongo-subrotundis subacutis obtusisve magis æqualiter dentatis, lobulo haud saccato (plica transversa); bracteis lanceolatis crebre argute spinulosis; perianthiis foliis duplo fere longioribus (1·5 × ·9^{mm}) anguste obovato-oblongis retusis subemarginatisve. Ad fl. *Bombonasa.*

Obs. The fertile branches, although short, innovate many times, there being only a pair of leaves between two consecutive ♀ flowers, which stand alternately right and left of the branch.

2. ODONTO-LEJEUNEA CALCARATA, Mont. (?)

Phragmicoma calcarata, Mont. Ann. Sc. Nat., 1843, p. 261 (?); *Lejeunea lunulata γ calcarata*, Syn. Hep. 326. *Odonto-Lejeunea chelidonura*, Spruce Mst.

Hab. In sylva Amazonica, præcipue secus fluvios *Negro* et *Bombonasa*, in foliis vivis, raro in cortice. In Andibus ad 1200m. alt. ascendit supra M. *Campana*.

F 1·4 × 1·25, *lob* ·6 *altus*, ·35 *latus* (*ad plicam*), *c* $\frac{1}{25}$; *f*^{la} ·85 × ·8 (*calcaria* ·35); *br* ·9; *br*^{la} ·75 × ·8; *per* 1·35 × 1·05mm.

Majuscula rufo-badia prostrata arcte adrepens. Caules 1–2-pollicares vage ramosi, vel in plagulæ ambitu distanter subpinnati, plerumque sparsi, raro in densum stratum intexti.

Folia magna ad $\frac{1}{3}$ lat. imbricata, angulo recto divergentia, subplana—siccando sæpe recurvo-crispula, late oblique ovata oblongave, fere dimidiata, apice rotundata vel superiora acutiuscula, margine toto, basi antica lata caulem transeunte excepta, argute serrato-vel spinuloso-dentata, dentibus æquidistantibus, 2 supra plicæ apicem cæteris sæpe majoribus, margine infero a medio incurva basinque versus sinuato-complicata; lobulus plus 2-plo brevior subplanus et appressus anguste ovato-trapezoideus, basi (i.e. plicâ) rectâ subtransversâ, axi cauli parallelâ, acuminulatus sæpeque apice 1-vel pauci-dentatus; cellulæ majusculæ subconformes hexagonæ, trigonis ad angulos conspicuis.

Foliola foliis vix duplo minora cuneato-orbiculata, toto margine distanter dentata spinosave—quasi polygona, angulis in dentem productis—basi profunde sagittato- (rarius hastato-) bifida, sc. utrinque in calcar prælongum acuminatum deorsum protracta.

Flores dioici: ♀ in ramis primariis terminales, innovatione simplice proliferave suffulti. Bracteæ foliis longe breviores ovatæ ovalesve acutæ spinulosæ, basi ipsa anguste sinuato-complicatæ (vix lobulatæ); bracteola subrotunda concava spinulosa.

Perianthia folium caulinum subæquantia, cuneato-oblonga truncata—vix obcordata, longirostria (rostello apice spinuloso), valde compressa, antice depressa, postice obtuse carinata, margine fere a basi late alata, ala superne arcte spinoso-serrata-ciliatave (sine spinis 3–5-cellulas lata).

Androecia ramos terminantia spicæformia; bracteæ plurijugæ haud confertæ, foliis 2–3-plo minores, ovales, acute serratæ, ad $\frac{1}{2}$ bifidæ, lobulo arcte involuto anguste fusiformi antheridia bina fovente.

Ad rivulum Cauapuna prope S. Carlos, in foliis, formam legi minorem, magis ramosam, pinnatam sterilem, foliis æqualiter argute dentatis, lobulo rhombeo; foliolis profunde (fere inciso-) dentatis, calcaribus baseos prælongis, cæterum foliolum subæquantibus, rectis vel paulo divergentibus.

Juxta fl. Bombonasa, in folio, aderat forma elata, tripollicaris, rufo-fulva, inæqualiter pinnata bipinnataque, foliis magnis magis divergentibus; perianthiis crebris pro planta parvulis, apice demum bilabiatis, labio postico subinde ad carinam hiante.

Eodem loco, in cortice, aderat altera forma, vage ramosa, foliis fere tam latis quam longis, semicordato-ovato-rotundis, minus argute dentatis; foliolis prælatis margine polygonis—angulis submuticis—solum basin versus paucispinis, calcaribus prælongis margine interno (juxta caulem) dente reflexo auctis; perianthiis parvis folia haud excedentibus; cum

descriptione Montagnei, l.c., "foliis suborbiculatis, amphigastriis basi utrinque spinoso-dentatis cæterum integerrimis," sat bene convenit.

Odonto-L. calcarata, in omnibus suis formis, ab *Odonto-L. lunulata* mihi distincta videtur foliolis magnis argute dentatis *basi sagittatis;* lobulis multo altioribus quam latis; perianthiis apice fere truncatis, rostello longo ore fimbriato mucronatis.

Obs. I have never seen an authentic specimen of Montagne's *Lejeunea calcarata*, and as he himself in the 'Sylloge'—his latest work—concurred with the authors of the 'Synopsis' in regarding it a mere variety of *L. lunulata*, I am doubtful if the plant above described be the same. My plant I believe perfectly distinct from *L. lunulata*, especially by the *sagittate under-leaves*, produced at each basal angle into a long sharp spur, or spine, and not unlike a swallow's tail, or the tailed wings of a *Papilio*, whence the name I gave it many years ago, *Lejeunea chelidonura*.

3. ODONTO-LEJEUNEA RHOMALEA, Spruce.

Hab. In sylva *Canelos*, ad *Rio Verde* fl. *Pastasa* affluentem, alt. 1400 m., in ramulis.

F 2·0 × 1·6, 1·8 × 1·5; *lobuli plica* ·6–·5, *alt* ·75–·6; f^{la} ·85 × 1·1; *c* $\frac{1}{25}$—$\frac{1}{30}$ mm.

Robusta rufo-badia, in sicco valde crispa. Caules 2–3-pollicares repentes, ramos inæquilongos subdivisos, alios assurgentes, edentes.

Folia arcte (ad $\frac{2}{3}$ lat.) imbricata semicordato-ovata rotundata margine toto serrato-vel spinuloso-denticulata, basi antica caulem transeuntia, sinuato-complicata, plica recta transversa folio plus 3-plo breviore; lobulus planissimus subobliquus triangulari-ovatus, angulato-crenatus, crenulis 4 v. 5 cellulam unicam opacam sistentibus; cellulæ mediocres æquilateræ, versus folii medium basinque majores.

Foliola foliis plus duplo breviora, a basi cuneatâ sagittatâ reniformia, apice lato undulato-crispo integerrima, basin versus spinuloso-dentata, dentibus utrinque 4–5, infimo magno. Foliola caulis ramorumque repentium discum radicellarum magnum gerunt, ramorum assurgentium tamen arhiza sunt.

Cæteris affinibus robustior, siccando crispatissima, foliis maximis latissime imbricatis haud falcatis, lobulo toto margine distanter crenulato (nec apice solo 2–3-dentato, ac in *L. lunulata*) et foliolis apice prælato crispo integerrimis solumque prope basin dentatis, facile distincta species videtur. *L. calcarata* folia habet laxius imbricata fere dimidiata, lobulo eodem fere ac *L. lunulatæ*, et foliola rotunda basi longius sagittata margine toto spinosa.

4. ODONTO-LEJEUNEA CHÆROPHYLLA, Spruce.

Hab. Andes Peruvianos et Quitenses: *Tarapoto*, in foliis vivis, necnon in *Bryo-Lejeunea diffusa* repens, alt. 600m; Tunguragua, in arborum foliis, alt. 2100m.

F 1·3 × 1·0; *lob* ·5; *c* $\frac{1}{35}$; f^{la} ·55 × ·55; br^{la} ·9 × ·65; *per* 1·2 × ·9mm.

Prostrata, sat robusta, rufo-badia, siccando crispa. Caules bipollicares, inæqualiter bipinnati, plus minus intricati.

Folia laxiuscule imbricata, angulo 60°–80° patentia, late oblique ovata rotundata, basi anticâ lata caulem obtegentia, convexa, subcrispula, margine circumcirca fere dentata, postico valide late decurva basinque

versus complicata; lobulus folio triplo fere brevior, saccatus decurrens, subovatus, apice plano rotundato exciso-tridentatus (dentibus cellula unica opaca sæpe apiculatis); cellulæ parvulæ subconformes pellucidæ.

Foliola foliis vix triplo minora, orbiculata, basi cordata, auriculis parvis sinuato-reflexis rotundis, margine integerrima vel obsolete denticulata.

Flores monoici: ♀ in ramis terminales, innovatione brevi rarius iterum floriferâ suffulti. Bracteæ foliis longe breviores, ovales acutæ dentatæ, basi postica minute inflexæ vel non; bracteola ovali-rotunda suborbiculatave, concavissima, margine toto late recurvo integerrimo.

Perianthia emersa, f. caulinis vix breviora, cuneato-oblonga, subobcordata, compressa, brevirostria, postice altiuscule obtuse carinata, margine ab apice ad $\frac{2}{3}$ longit. usque anguste alata, ala spinuloso-denticulata, (sine dentibus 3 cellulas lata), rostello integro.

Andrœcia ad caulem et ramos lateralia, spicæformia, folio collaterali subæquilonga; bracteæ sub 6-jugæ, subinæquilobæ; lobulo = lobi $\frac{2}{3}$, involuto-inflato; lobo subacuminato, acuto rariusve obtuso, integerrimo; antheridia bina.

A beautiful and very distinct plant—apparently the only monoicous species among the *Odonto-Lejeuneæ*. The leaves are so widely incurved at the postical margin, especially towards the apex, that they become almost funnel-shaped.

5. ODONTO-LEJEUNEA 10-DENTATA, Spruce.

Hab. Ad fl. *Bombonasa* in sylva *Canelos*, alt. 600^{m}, in *Iriarteæ* pinna; *Chimborazo*, alt. 1200^{m}, in filice.

F ·85 × ·6, *lob* ·1; *c* $\frac{1}{2\cdot5}$; *f*^{la} ·25 × ·25; *br* ·8; *br*^{la} ·55 × ·35; *per* 1·2 × 1·0^{mm}.

Pusilla rufa prostrata. Caules pollicares subpinnatim ramosi, ramis brevibus.

Folia pro plantula magna paululum imbricata subplana suboblique oblongo-obovatove-rotunda, margine antico apiceque argute spinuloso-dentata, dentibus sub 10, 3 v. 4 cellulas longis, basi 2 v. 3 cellulas latis, postico integerrima raro minute 1–2-spinulosa, basi sæpius levissime vel obsolete inflexa; lobulus (quando raro adest) parvus ovatus subinflatus, apice vel mutico transeunte vel apiculato-acuto; cellulæ majusculæ subconformes pellucidæ.

Foliola plus triplo minora, distantia ovali-rotunda, paulo longiora quam lata, e basi decurrente subspathulata, integerrima.

Flores dioici: ♀ in ramo innovando-prolifero terminales (ad speciem laterales). Bracteæ foliis parum diversæ, basi parvilobulatæ (vel altera non); bracteola foliolis duplo major oblonga vel ligulato-oblonga truncato-rotundata subretusave integerrima.

Perianthia foliis dimidio longiora obcordato-triangularia, angulis apicis rotundatis, rostello brevi in sinu, valde compressa, postice late convexo-carinata, margine supra medium alata, ala 2–3 cellulas lata longispina, spinis utrinque 8–10 sub 5 cell. longis, subulatis sæpe hamatis.

Planta pulchella, est quasi *L. hamulata* nana, ab illa tamen distinctis-

sima. *Odonto-L. hapalochroa* certe distat statura minore, textura tenerrima; foliis lobulo majusculo auctis paucidentatis; perianthiis truncatis, utraque ala solum 3-spinosa.

6. ODONTO-LEJEUNEA HAPALOCHROA, Spruce.

Hab. Andes Peruvianos, in M. *Guayrapurina*, supra filices, alt. 900^{m}.

F 1·0 × ·8, *lob* ·3, *c* $\frac{1}{30}$—$\frac{1}{24}$; *f*^{la} ·35 × ·35; *br* ·75; *per* 1·1 × ·9^{mm} (*spinis inclusis*).

Pusilla pallida tenerrima. Caules vix $\frac{1}{4}$ poll. longi parce divergenti-ramosi.

Folia magna pellucida contigua vel subimbricata, late semiovato-oblonga rotundata, supra medium angulato-dentata, dentibus paucis (sub 5) dissitis, basi postica recte complicata; lobulus lobo ter brevior angustus incurvus inflatusve, apice triangulari obtuso; cellulæ mediocres æquilateræ leptodermes, inferiores sensim majores.

Foliola foliis triplo fere breviora distantia suborbiculata integerrima, basin versus haustorium radicellarum disciforme gerentia.

Flores dioici: ♀ terminales, cum innovatione. Bracteæ appressæ foliis minores semiobovatæ apice denticulatæ, lobulo 0; bracteola obovato-rotunda.

Perianthia f. caulina parum excedentia cuneata truncata retusulave brevirostria valde compressa, antice subplana, postice carinata, margine supra medium alata, ala utrinque 3-spinosa vel potius 3-laciniata.

7. ODONTO-LEJEUNEA SURINAMENSIS, Mont.

Ann. Sc. Nat. XV., 110; G. L. et N. Syn. Hep. 329.

Hab. Fl. *Bombonasa*, in filice et palmarum pinnis necnon in saxis irriguis; Fl. *Uaupés*, in *Marantaceæ* folio. In Surinamo legit SPLITZGERBER.

F ·6 × ·43, ·5 × ·35, ·4 × ·3, *lob* ·125—·1, *c* $\frac{1}{48}$; *f*^{a} ·2 × ·25, ·15 × ·25; *br* ·4; *br*^{la} ·35 × ·25; *per* ·6 × ·35^{mm}.

Pusilla albescens. Caules $\frac{1}{4}$-pollicares repentes crebre pinnati et subbipinnati, ramis assurgenti-arcuatis.

Folia imbricata semicordato-ovata dimidiata, apice decurvo oblique abrupte acuta, margine antico rotundato toto, postico subrecto solum apicem versus muricato-serrulata, prope basin involuto-complicata; lobulus 4-plo brevior subhorizontalis ovatus inflatus exciso-acutus; cellulæ parvæ pellucidæ æquilateræ, inferiores laxiores, subapicales multo minores et conico-subprominulæ.

Foliola subdissita, foliis triplo minora, squarroso-recurva, orbiculato-reniformia integerrima, basi discum radicellarum magnum ferentia, apice rotundata (nec retusa).

Flores dioici: ♀ in ramo terminales, innovatione suffulti. Bracteæ foliis breviores semiobovato-lanceolatæ acutæ, lobulo 4–5-plo breviore angusto; bracteola obovato-rotunda interdum retusula.

Perianthia f. caulinis æquilonga, anguste obcordato-obconica, valde compressa, antice subdepressa, postice late obtuse carinata, auriculis apicis profunde emarginati subrotundis complanatis margine spinulosis vel subinermibus, rostello e sinu brevissimo.

Andrœcia longispica, ramulum totum vel saltem ejus majorem partem

tenentia. Bracteæ plurijugæ, contiguæ vel subdissitæ, foliis 4-plo breviores subrotundo-inflatæ carinatæ apice breviter subinæqualiter bilobæ, diandræ.

Colore albo, foliis minoribus acutis crebre denticulatis, areolatione longe densiore, etc. etc., a *L. hapalochroa* longe distat.

Folia caulina aliquando paucidentata, fere integerrima; ramea contra arcte muricato-serrulata.—Carinæ perianthii posticæ revera duæ sunt, basi late dissitæ, superne sensim conniventes et in sinum apicis obcordati confluentes, ita ut carinam unicam latam sistere viderentur.

Ad saxa fl. *Bombonasa* irrigata advenit forma robusta dense depresso-cæspitosa, longe simplicior; foliis magis elongatis interdum subobtusis; cæterum cum typo congruit.

8. ODONTO-LEJEUNEA STACHYCLADA, Spruce.

Hab. In sylva Amazonica secus fluvios *Negro*, *Uaupés*, *Aripecurá*, etc., in arborum palmarumque foliis præcipueque in filicibus; juxta *Manáos* in cortice.

F ·5 × ·33, *lob* ·075—·1, *c* $\frac{1}{3-5}$; f^{la} ·1 × ·15; *br* ·45 × ·25; br^{l} ·35 × ·35; *per* ·6 × ·4, ·5 × ·4^{mm}.

Pusilla rufo-badia laxe repens. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicares vage vel pinnatim ramosi, aliis ramis brevibus, aliis elongatis parvi-confertifoliis spicam mentientibus.

Folia caulina subcontigua fere planissima semicordato-ovato-oblonga, vel sublanceolata, acuta, rarius acuminulata obtusave, margine præcipue antico distanter denticulata serrulatave, inferiora subintegerrima, badio-marginata, recte complicata—interdum ad plicæ apicem in dentem ad speciem protracta; lobulus minutus folio 5–7-plo brevior subovatus subinflatus; cellulæ mediocres pellucidæ, ambitu late opacæ, marginales subprominulæ opaciores. Folia ramorum elongatorum spicæformium minora conferta ovato-lanceolata argutius denticulata.

Foliola foliis 3–5-plo breviora, reniformia subquadratave, rotundato-truncata retusulave, rarius obcordata.

Flores dioici: ♀ terminales, innovatione brevi suffulti. Bracteæ foliis subminores ovales vel ovali-lancealatæ acutæ, vel serrulatæ vel grosse pauciserratæ, altera elobulata, altera (innovationi adnata) lobulata ad basin fere fissa, lobulo triplo minore lanceolato; bracteola subobcordato-orbiculata concava integerrima.

Perianthia subemersa, cuneata vel obtriangularia, apice lato truncata, margine supra medium paucispinulosa vel haud raro subinermia.

Andrœcia brevispica, vel ramulum cauligenum sistentia, vel in ramo terminalia; bracteæ sub 5–jugæ contiguæ compresso-subglobosæ.

Obs. Lobulus foliorum variabilis aliorum ramorum interdum folio solum 4-plo brevior.

9. ODONTO-LEJEUNEA TRUNCATULA, Spruce.

Hab. In Andium Quitensium radicibus, alt. circiter 1200^{m}.: *Mapóto*, in sylva *Canelos*, ad arbores inter muscos (♂); *Chimborazo*, in filice (♀), sociis *Odonto-L. surinamensi* aliisque *Lejeuneis*.

F ·65 × ·4, ·6 × ·45; *lob* ·30–·25; *c* $\frac{1}{44-40}$; f^{la} ·28 × ·35; *br* ·65; br^{la} ·35 × ·4; *per* ·75 × ·6, ·6 × ·6^{mm}.

Pusilla dense cæspitosa rufo-badia. Caules semipollicares basi fasciculato-

ramosi, dein assurgentes subpinnati, ramis brevibus paucifoliis apice circinato-decurvis.

Folia subimbricata patula decurvo-falcata semiovata vel semiovato-lanceolata, subacinaciformia, abrupte acuta acuminulatave, margine antico toto argute muricato-serrulata, postico, apice serrulato excepto, integerrima, infra medium sinuato-lobulata; lobulus 2–3-plo brevior, in situ anguste convolutus, subcylindricus fusiformisve, explanatus autem subrotundus, integerrimus; cellulæ parvulæ pellucidæ, pariete ad angulos incrassato, inferiores submajores.

Foliola plus duplo breviora, squarroso-recurva, subquadrata (paulo latiora quam longa) apice lato emarginato-truncata, angulis sinuque (perbrevi) pro more acutis, basi rotundata, margine integerrima; superiora autem, florem ♀ versus increscentia, denticulata vel subspinulosa, suprema (i.e. bracteola) fere semper integerrima.

Flores dioici: ♀ terminales, innovatione suffulti. Bracteæ muricato-spinulosæ, inæquilongæ, altera libera foliis æqualis oblique obovato-lanceolata acuta, lobulo minuto lineari-rhomboideo aucta, altera duplo brevior lanceolata elobulata innovationi adnata; bracteola suborbiculata cochleato-concava repanda integerrima.

Perianthia obcordato-spathulata, sinu apicali profundissimo, valde compressa, postice parum convexa, opaca, margine subincrassato integerrima.

Andrœcia (juniora) apicalia, plerumque brevispica; bracteæ laxiusculæ, subinæquilobæ, lobulo subacuto.

Cum *L. Surinamensi* intricata crescit, difficile extricanda, facilius distinguenda: colore badio; caule minus ramoso; ramis validioribus; foliis crebrius setuloso-ciliatis; foliolis squarrosis semper emarginatis, superioribus denticulatis; perianthiis apice inermibus, nec subspinulosis.—*L. convexistipa*, Gotts., differt foliis acuminatis, foliolis rotundis, perianthiis apice denticulatis.—*L. truncatula L. peruvianæ* e longinquo affinis !

10. ODONTO-LEJEUNEA PERUVIANA, L. et Ldbg.

Nov. et minus cogn. stirp. Pug. v. (1833) 18; G. L. et N. Syn. Hep. 339.

Hab. Per totam sylvam Amazonicam, ad arborum præcipue palmarum folia, frequens; in Andium radicibus orientalibus vix supra 600^{m}. alt. ascendit.

F caulina 1·4 × ·8, *ramea* 1·0 × ·65, ·75 × ·6; *lob* ·4–·45; *e* $\frac{1}{30}$; *f*^{la} ·5 × ·65, ·3 × ·3; *br* ·75 × ·45; *br*^{la} ·5 × ·3; *per* ·95 × ·7, ·9 × ·8^{mm}.

Elata rufo-badia late arcte repens. Caules 1–2-pollicares subbipinnati, ramis crebris pro more brevibus, validi, strato corticali cellulis magnis ovali-cylindricis 7-seriatis, stratis internis duobus e cellulis 2–3-plo angustioribus elongatis, constantes.

Folia subimbricata subfalcata semiovata—interdum basi semicordata apice decurvo rotundata vel oblique subacuta, margine antico apiceque spinuloso-denticulata (caulina obsolete, ramea argutius, insuperque margine celluloso-muriculata), postico integerrima incurvula infraque medium sinuato-complicata, ad sinum sæpe in dentem ad speciem devexa; lobulus subtriplo minor transversus ovato-trapezoideus inflato-saccatus apice in folium sensim transiens; cellulæ mediocres æquilateræ pellucidæ, marginem anticum apicemque versus multo minores, paucæ supra basin sat majores interdum in ocellum aggregatæ.

Foliola caulina remota foliis fere 5-plo minora orbiculata denticulata, apice ad $\frac{1}{6}$–$\frac{1}{4}$ emarginato-bifida, raro integra; ramea multo majora, superiora folio adjecto sæpe perpaulo minora, argutius denticulata fere ad $\frac{1}{2}$ bifida; omnia ex alis recurvis cochleata, haustorium discoideum parvum pallidum gerentia.

Flores dioici: ♀ in ramo sæpe brevi terminales, innovatione simplice suffulti. Bracteæ foliis multo minores lanceolatæ serrulatæ basi breviter complicatæ, lobulo lineari-rhomboideo; bracteola ovalis subbifida integrave denticulata (in fl. sterili ad $\frac{1}{2}$ bifida.)

Perianthia emersa obcordato-triangularia valde compressa, supra depressa subtus convexo-carinata vel solum gibba, margine supra medium peranguste alata serrulataque.

Andrœcia longispica ramulo tenui constantia; bracteæ minutæ subcontiguæ arcte complicatæ solum basi ventricosæ.

Foliorum lobulus medio sæpe in literæ S formam sinuatus.

Var. *megalostipa*, rufa planissima siccando haud crispata, foliolis (superioribus præcipue) foliis paulo minoribus ad $\frac{1}{2}$ bifidis.—*Hab.* ad fl. *Bombonasa* et *Uaupés*.

Ad eandem speciem pertinere videntur *L. foliorum*, Nees in Syn. Hep. 326, et *L. Chitonia*, Tayl. in L. et L. op. supra cit. Pug. viii. (Syn. Hep. 339).

SUBGENUS XVIII.—*PRIONO-LEJEUNEA*, S.

Plantæ pusillæ, sæpe albicantes, prostratæ v. laxe reptantes. Caules vage v. subpinnatim ramosi, ramis pro more paucis.

Folia parva parum imbricata decurvula sæpissime acuta acuminatave, e cellulis marginalibus conicis crenulata serrulatave, interdum facie muriculata; lobulus 2–6-plo minor inflatus, rarius obsoletus; cellulæ $\frac{1}{60}$–$\frac{1}{30}$ mm, plerumque parvulæ, pellucidæ, pariete ad angulos subincrassato, marginales (raro omnes fere) conicæ, subbasales sæpe multo majores.

Foliola parva minutave subrotunda fere semper integerrima, in pluribus adusque (in paucis ultra) medium bifida; radicellæ fasciatæ penicillatæve—nunquam in discum radiantes.

Flores in plurimis monoici, in paucis dioici. Rami ♀ in aliis sp. brevissimi simplices, in aliis innovantes. Bracteæ foliis plerumque minores parvilobulatæ, argutius denticulatæ spinulosæve; bracteola bifida.

Perianthia iis *Odonto-Lejeuneæ* sat similia, sc. obcordata compressa postice obtuse 1-carinata, rarius tamen alata, plerumque margine solum muricato-spinulosa.

Andrœcia ramulo tenui cauligeno constantia, raro terminalia; bracteæ parvulæ 2–20-jugæ diandræ.

Obs. Odonto-L. Peruviana nexum cum *Priono-Lejeunea* præbet, differt autem statura elatiore; foliis magnis sæpe argute dentatis; foliolis dentatis, aliis bilobis, aliis solum emarginatis v. etiam (sed rarissime) integris.

Hab. In arborum foliis, ramis truncisque, sæpe supra alias hepaticas repentes; planitiem et montes humiliores diligentes.

Distr. Species 16 vel plures cognovimus, omnes mere tropico-Americanas (nisi *L. microdonta* G. etiam in insula Hawaii inventa), in insulis Antillis, Venezuela, Guiana et Amazonia frequentiores, in Brasiliæ Peruviæque austrinis (ut videtur) rariores. Ipse in sylva Amazonica et in Andibus orientalibus—vix supra 1200^{m} ascendentes—10 species legi.

A. *Rami* ♀ *brevissimi simplicissimi.*

a. *Flores dioici.*

1. *Priono-L. fabroniæfolia.* Elongata parum ramosa flavescens. F. subcontigua planiuscula ovata tenuicuspidata margine toto argute muricato-spinulosa, sæpius elobulata. Foliola 4-plo minora bipartita, laciniis ovato-lanceolatis acuminulatis. Br. foliis minores acuminatæ spinulosæ; bracteola lanceolata ultra $\frac{1}{3}$ bifida, segmentis acuminatis, subserrulata. Per. obcordato-cuneata compressa, postice 1-carinata, margine tenui superne muricato-denticulata.
2. *Priono-L. muricato-serrulata.* Pusilla, caule filiformi paucirameo. F. dissita lanceolata subacuta muricato-serrulata, lobulo mediocri inflato nullove. Foliola 6-plo breviora profunde bifida, segmentis acutis. Br. foliis sublongiores acutilobæ; bracteola ad $\frac{1}{2}$ bifida obovato-lanceolata.

aa. *Flores monoici.*

3. *Priono-L. recurvula.* Pusilla flava laxe ramosa. F. contigua semiovato-lanceolata apice decurvo tortili acuminulata, margine recurvulo argute muricato-serrulata, facie lævia, sinuato-complicata, lobulo 3-plo breviore inflato. Foliola f. 3-plo breviora oblongo-rotunda ad $\frac{1}{2}$ bifida, segmentis acuminulatis. Br. foliis æquales muricato-serrulatæ, lobo falcato-lanceolato subacuminato; bracteola cuneato-lanceolata ad $\frac{1}{3}$ bifida. Per. emersa cuneata compresso-plana apice lato retuso muricato-spinulosa. Andr. brevispica.
4. *Priono-L. denticulata.* Submajor pallide flavescens inæqualiter subbipinnata. F. subimbricata decurva semicordato-ovata acuminulata muricato-denticulata apiceque subserrulata valde sinuato-complicata, lobulo 5-plo breviore inflato. Foliola 2–4-plo breviora suborbiculata ultra $\frac{1}{2}$ bifida segmentis subacuminatis. Br. f. minores acutæ muricato-serrulatæ; bracteola obovato-lanceolata ad $\frac{1}{2}$ bifida serrulata. Per. foliis caulinis sublongiora obcordato-spatulata valde compressa postice convexo- (raro acute) carinata, profunde emarginata, margine superne muriculato-dentata v. subspinulosa. Andr. sæpe longispica.
5. *Priono-L. temnantha.* Pusilla albida subfasciculatim ramosa, ramis arcuantibus. F. subimbricata fornicata late oblique ovata acuta argute muricato-serrulata, lobulo 3-plo breviore. Foliola 4–6-plo breviora subrotunda ultra $\frac{1}{2}$ bifida, segmentis acutis. Br. foliis sublongiores iis *L. recurvulæ* fere conformes. Per f. fere 2-plo longiora cuneata recte truncata subretusave, margine superne muricata setulosave, postice altius carinata. Andr. brevispica.

B. *Rami* ♀ *semel v. iteratim innovando-elongati.*

b. *Flores monoici.*

6. *Priono-L. microdonta.* Pallide viridis vage subpinnata. F. subimbricata decurva, interdum subfalcata, oblique ovata rotundata raro

subacuta, lævia v. apicem versus muriculata, celluloso-crenulata-serrulatave, ocellata, subsinuato-complicata, lobulo 4-plo breviore inflato. Foliola sub 5-plo minora ovali-rotunda ad ½ bifida. Br. f. minores serrulatæ profunde bilobæ, lobo semilanceolato obtuso; bracteola obovato-lanceolata brevissime bifida. Per. f. sublongiora, cuneata retusa v. obcordata, postice convexo-carinata, margine superne muriculata. Andr. sæpius brevispica.

7. *Priono-L. macrocardia.* Priori proxima. F. parva planiuscula semi-ovato-rotunda subacuta rotundatave margine muriculata facie lævia, exocellata, sinuato-complicata, lobulo turgido. Foliola 5-plo minora orbiculata ad ½ bifida. Br. iis prioris subconformes. Per. magna foliis fere 3-plo longiora cuneata apice profundiuscule emarginata, margine supra medium spinulosa. Andr. brevispica.

8. *Priono-L. leptocardia.* Pusilla pallida pellucida tenera subpinnata. F. magna planiuscula fere semicircularia subacuta rotundatave, facie fere tota margineque argute celluloso-muriculata, recte complicata, lobulo majusculo v. obsoleto. Foliola 4-plo minora subrotunda paulo ultra ½ bifida. Br. foliis minores muricato-denticulatæ, subelobulatæ; bracteola ovali-lanceolata ad ½ bifida. Per. foliis sublongiora obcordato-cuneata fere complanata, margine supra medium ala 3–4 c. lata serrulata aucto.

bb. *Flores dioici.*

9. *Priono-L. scaberula.* Pusilla pallida pauciramosa. F. divergentia concava oblique ovata rotundata rarius subacuta, cellulis prominulis facie asperula margineque erosa serrulatave, valde sinuato-complicata, lobulo 3-plo breviore saccato. Foliola superiora ½ folii æquantia rhombeo-rotunda paulo ultra ½ bifida. Br. f. sublongiores muricato-serrulatæ obovatæ concavæ parvilobulatæ; bracteola obovato-rhomboidea ad ⅓ bifida.

10. *Priono-L. asperrima.* Minuta viridis fragilis subramosa. F. suberecta obovato-rotunda subconcava, margine toto faciebusque e cellulis alte acute prominulis asperrima, sinuato-complicata, lobulo ½ f. fere æquante turgido. Foliola minuta bipartita, cruribus subulato-acuminatis. Br. magnæ asperrimæ ad ½ bilobæ vix complicatæ, lobo oblique obovato subacuto, lobulo parvo; bracteola ovali-ligulata ad ⅓ bifida, segmentis acutis.

(Videas etiam *Priono-L. muricato-serrulata* ad ♀ A.)

1. PRIONO-LEJEUNEA FABRONIÆFOLIA, Spruce.

Hab. In M. *Campana*, ad saxa, sterilis; *Chimborazo*, in arborum foliis, cum aliis *Lejeuneis*, fertilis; alt. circiter 1300^{m}. viget.

F ·5 × ·35; *c* $\frac{1}{50}$; *f*^{la} ·13; *br-lobus* ·4 × ·2, ·55 × ·25; *br*^{la} ·35 × ·15, ·4 × ·16; *per* ·75 × ·5^{mm}.

Prostrata, flavescens. Caules subpollicares fastigiati, subsimplices v. perpaulo ramosi, tenues, flexuosi.

Folia subcontigua, fere plana, suboblique ovata tenui-cuspidata, margine toto argute muricato-serrulata-spinulosave, pleraque elobulata, lobulo tamen (quando præsente) brevi subovato inflato; cellulæ parvæ subæquilateræ, paucæ subbasales duplo majores fere in orbem dispositæ.

Foliola distantia foliis 4-plo minora *bipartita*, laciniis subdivergentibus ovato-lanceolatis acuminulatis, integerrima.

Flores dioici: ♀ in ramo brevissimo terminales, foliis parvis 1–2-jugis infra bracteas suffulti, innovatione nulla. *Bracteæ* foliis minores ultra medium bifidæ; lobus oblique lanceolatus acuminulatus spinuloso-serrulatus; lobulus rhomboideus acuminatus lobo duplo angustior; bracteola lanceolata, vel anguste obovato-lanceolata, ad $\frac{1}{3}$ vel fere ad medium bifida, segmentis acuminatis, parum serrulata.

Perianthia emersa obcordato-cuneata, compressa, margine tenui supra medium inæqualiter muricato-denticulata, postice altiuscule obtuse unicarinata.

Folia in pl. Campanensi subduplo serrulata.—*L. mucronata* Lac. in "Syn. Hepat. Javanicarum" (in mantissa ad finem), e Venezuela, nostræ ob "folia ovata denticulata piliformi-mucronata" proxima, differt foliis dorso tuberculosis, foliolis denticulato-ciliatis.

2. PRIONO-LEJEUNEA MURICATO-SERRULATA, Spruce.

Hab. In cortice vetusto, supra alias *Lejeuneas* repens, ad fluvium *Ramos* flumini Amazonum tributarium, etiam ad *Tauaũ* prope *Pará*.

F ·3 × ·15, *lob* ·08, *c* $\frac{1}{60}$; *f*^{la} ·05; *br* ·4; *br*^{la} ·35 × ·15^{mm}.

Pusilla pallide rufula prostrata; caules pollicares filiformes parce vage ramosi.

Folia dissita erecto-patentia oblique lanceolata—interdum anguste ovalia obovatave—abrupte acuta, rarius obtusa, toto margine muricato-serrulata; lobulus 4-plo brevior—aliorum ramorum solum 2-plo brevior, aliorum obsoletus—subovatus, basi turgidus, margine inflexo subtransverso, apice acuto; cellulæ minutulæ subelongatæ, pellucidæ, ambitu subopacæ, pariete incrassato, planæ convexæve, subapicales tamen marginalesque alte conico-prominulæ.

Foliola distantia minuta, foliis 6-plo minora, subrotunda, profunde bifida, sinu lato sæpe lunulari, segmentis lato-subulatis acutis.

Flores dioici: ♀ in ramo brevissimo, folio singulo parvo folioloque infra bracteas stipato, terminales, innovatione nullâ, vel rarissime brevi simplice, suffulti. Bracteæ folia subexcedentes complicato-bilobæ, lobis lanceolatis acutis, inferiore duplo minore; bracteola obovato-lanceolata, ad $\frac{1}{2}$ bifida, rima angusta, segmentis acutis.

Obs. This very distinct species affords the only example I have met with of a normally determinate short female axis becoming occasionally (but very rarely) indeterminate, by putting forth an innovation beneath the flower. I did not succeed in finding perianths nor male plants.

3. PRIONO-LEJEUNEA RECURVULA, Spruce.

Hab. In fl. *Negro* sylvis juxta *S. Gabriel*, in cortice.

F ·4 × ·3, *lob* ·13, *c* $\frac{1}{40}$; *f*^{la} ·125 × ·1; *br* ·4; *br*^{la} ·35 × ·15; *per* ·6 × ·5^{mm}.

Pusilla, flava, subrufescens, prostrata; caules centimetrum longi, laxe ramosi.

Folia contigua, falcato-subdivergentia, semiovato-lanceolata, apice decurvo *tortili* acuminulata cuspidatave, margine anguste *recurvula*, inæqualiter muricato-serrulata, raro hic illic spinulosa, a basi ad $\frac{1}{3}$ alt. cum lobulo connata, carinâ convexâ obtusâ, ad lobuli apicem valde sinuata;

lobulus 3-plo minor ovatus inflatus exciso-acutus; cellulæ parvulæ (inferiores majores), valide incrassatæ, pellucidæ, annulo chlorophylli angusto, marginales conicæ, cæteræ planæ.

Foliola distantia triplo minora oblongo-rotunda ad medium acute bifida, segmentis acuminulatis.

Flores monoici: ♀ ramulo perbrevi constantes, innovatione nulla. Bracteæ 1-jugæ foliis æquales falcato-lanceolatæ subacuminatæ muricato-serrulatæ, lobulo duplo minore angusto lineari-rhomboideo acuto; bracteola cuneato-lanceolata ad $\frac{1}{3}$ acute bifida, serrulata.

Perianthia emersa cuneata v. obtriangularia, retusa, subobcordata (obscure rostellata) compressa, margine complanata, apice lato muricato-spinulosa.

Amenta ♂ folium caulinum vix æquantia; bracteæ parvulæ 2–6-jugæ.

Species pulchra distinctissima, colore rufulo, foliis minoribus angustioribus *acumine longiore tortili, margine toto recurvulo*, argutius muricato-spinulosis, lobulo majore; foliolis angustioribus; perianthiis demum magis spinulosis.

4. PRIONO-LEJEUNEA DENTICULATA, Web.

Jung. denticulata Web. Prodr. 30; G. L. et N. Syn. Hep. 337.

Hab. In sylvis fl. *Negro*, *Uaupés*, *Casiquiari*, etc. frequens, in cortice ramulisque, rarius in foliis vivis, semper fere super alias *Lejeuneas* vel *Plagiochilas* parasitans; ad pedem occidentalem montis *Chimborazo*, alt. 1000^{m}. In insulis Antillanis sat frequens videtur.

F ·65 × ·45, ·5 × ·38, *lob* ·1–·15; *c* $\frac{1}{50}$; f^{la} ·3 × ·3, ·25 × ·25, ·15 × ·15; *br* ·35; *per* ·65 × ·6^{mm}.

Mediocris, pallida, subflavida, tenuis. Caules pollicares filiformes flexuosi inæqualiter pinnati et subbipinnati, arcte repentes, intricati, ramis elongatis sæpe subliberis arcuantibus. Radicellæ vel fasciatæ vel in haustorium scopæforme patentes, apice nodoso-ramosæ.

Folia parum (ad $\frac{1}{5}$ lat.) imbricata, decurva, raro subplana, semicordato-ovata subabrupte brevi-acuminulata acuta, apicem versus erosula v. subserrulata, margine toto e cellulis prominulis muricato-denticulata, valide sinuato-complicata, supra sinum divergentia; lobulus folio sub 5-plo brevior ovatus inflatus, apice brevi incurvo, raro obsoletus; cellulæ parvæ subæquales, solum inferiores sensim majores, marginales conicæ, cæteræ convexæ v. fere planæ, omnes pariete ad angulos incrassato.

Foliola dissita, foliis 2–4-plo minora, suborbiculata, ultra $\frac{1}{2}$ acute bifida, segmentis acutis subacuminatisve, integerrima.

Flores monoici: ♀ in ramo brevissimo, foliis parvis unijugis nullisve, folioloque unico infra florem stipato, terminales. Bracteæ foliis sat minores, complicato-bilobæ, lobo oblongo acuto, lobulo longe minore rhomboideo; bracteola tenuis obovato-lanceolata ad $\frac{1}{4}$ acute bifida; omnes margine muriculatæ apiceque interdum serrulatæ.

Perianthia f. caulinis sublongiora obcordato-cuneata-spathulatave, valde compressa, antice depressa postice convexo-carinata, apice profunde emarginata brevi-rostellata, margine supra medium sparse muriculato-dentata, interdum dente longiore hic illic interposito subspinulosa, carina postica lævi rarissime aspera.

Androecia tenui ramulo constantia; bracteæ 4–12-jugæ foliis plus duplo

minores confertæ ovoideo-cymbiformes subinæquilobæ, ad carinam obtusam pellucide tuberculosæ, diandræ.

Var. *subintegerrima*: tenuis laxifolia; foliis sæpe elobulatis, e cellulis obtusioribus margine solum crenulatis vel integerrimis; perianthiis apice minus conspicue emarginatis.

L. decora Tayl. ! in hb. Hook., ex insula Dominica, vix differt nisi bracteis spinulosis, perianthiisque superne pauci-longispinis.

5. PRIONO-LEJEUNEA TEMNANTHA, Spruce.

Hab. M. *Guayrapurina*, in cortice vetusto, cum *Lophocolea muricata*.

F ·35 × ·25, *lob* ·13, *c* $\frac{1}{40}$; *f*^{la} ·08 × ·08, ·06 × ·06; *br lob* ·5 × ·25; *br*^{la} ·4 × ·2; *per* ·6 × ·4^{mm}.

Pusilla, albida, dein rufescens. Caules 6^{cm} longi, subfasciculatim ramosi, ramique sæpe arcuati.

Folia subimbricata fornicato-decurva, basi ad lobuli altitudem usque insigniter constricta, deinde abrupte antice dilatata, late oblique ovata (subdimidiata), sensim abrupteve acuta, margine toto, basi constricta excepta, e cellulis prominulis argute muriculata; lobulus triplo fere brevior; cellulæ parvulæ subconformes subincrassatæ pellucidæ, marginales superiores conico-prominulæ.

Foliola distantia 4–6-plo breviora, subrotunda, paulo ultra medium bifida, segmentis acutis.

Flores monoici; ♀ ramulo brevi, sine ulla innovatione, constantes. Bracteæ internæ foliis sublongiores, profunde bifidæ, subcomplicatæ, lobo falcato-lanceolato acuto muriculato-serrato, lobulo multo minore lineari; bracteola cuneato-lanceolata ad $\frac{1}{3}$ bifida, segmentis acutis, serrulata.

Perianthia f. caulina fere 2-plo excedentia viridia rufave cuneata, apice fere recte truncata, v. subretusa, raro subobcordata, erostria, margine supra medium muricata setulosave, facie postica alte obtuse unicarinata. Calyptra paulo minor tenuis apice inequaliter 4-fida.

Andrœcia ramulo folium axillare sublongiore constantia; bracteæ mediocres sub 4-jugæ.

Statura humiliore, foliis solum acutis, margine muriculatis—nec acuminatis subserratis; foliolis duplo minoribus; perianthiisque angustioribus, haud apice profunde emarginato-bilobis, a *L. denticulata* certe differt.

6. PRIONO-LEJEUNEA MICRODONTA, Gottsche.

in Syn. Hep. 337.

Hab. In sylvis flum. Amazonum primum legit cel. MARTIUS; ipse ad fl. *Negro* superiorem in filicibus (in *Trichomane elegante* et *trichoideo* præcipue), ad fl. *Uaupés* in formicarum nidis, prope *Pará* supra alias hepaticas in truncis prostratis repentem. Fide cl. auctorum "Syn. Hepat." etiam insulæ S. Vincentis et *Hawaii* incola est.

F ·6 × ·5, ·5 × ·42, *lob* ·15–·125, *c. mediæ* $\frac{1}{30}$, *marginales* $\frac{1}{60}$; *f*^{la} ·125 × ·1; *br* ·55; *br*^{la} ·4 × ·25; *per* ·8 × ·5; *amenta* ♂ 1·3, *br* ♂ ·08^{mm}.

Pallide viridis prostrata intricata. Caules 1–1½-pollicares teneri vage vel subpinnatim ramosi.

Folia subimbricata patulo-decurva, sæpius divergentia, interdum falcata, oblique vel subsemi-ovata rotundata, rarius apice triangulari obtusa subacutave, basi ipsa angusta, dein antice abrupte truncato-dilatata (sed non semicordata) subsinuato-complicata, margine e cellulis prominulis serrulato crenulatove; lobulus folio 4-plo brevior ovatus vel semiovatus inflatus, margine inflexo horizontali, apice acuto; cellulæ mediocres hexagonæ, marginales duplo minores quadratæ et conico-prominulæ, basales 5–8 (in seriebus duabus) cæteris multo majores elongatæ pellucidæ ocellum sistentes.

Foliola foliis 4-plo minora ovali-rotunda ad $\frac{1}{2}$ bifida, sinu segmentisque subacutis.

Flores monoici: ♀ in ramo perbrevi terminales, innovatione—sæpe ♂, raro ♀—suffulti. Bracteæ foliis minores ad $\frac{1}{3}$ bilobæ, lobo semiobovato-lanceolato obtuso, lobulo angusto rhomboideo vel subrectangulari; bracteola obovato-lanceolata brevissime (ad $\frac{1}{5}$) bifida, segmentis contiguis acutis.

Perianthia altiuscule emersa, obcordato-cuneata, e sinu parum profundo brevissime rostellata, compressa, antice subplana, postice late convexo-carinata, margine complanato supra medium apiceque inæqualiter celluloso-serrulata-crenulata-erosulave, demum bilabiata.

Amenta ♂ vel ramulo tenui folium caulinum superante constantia, vel in ramis terminalia; bracteæ 3–7-jugæ minutæ laxiusculæ.

Species valde variabilis, foliis nunc margine fere lævissimis, nunc serrulatis crenulatisve, basin versus distincte (vel vix) ocellatis; perianthiis margine vel argute vel obsolete muricato-serrulatis, rarius setosis vel subspinulosis.

Ad *S. Carlos*, in *Trichomane sp.*, legi formam foliis argutius serrulatis indistincte ocellatis; perianthiis subrecte truncatis, vix retusis—minime obcordatis, superne argute crebre muricato-serrulatis, muricibus cellula unica elongate conica subulatave constantibus, raro 2 v. 3 cell. longis; andrœciis longispicis (bracteis 6–10-jugis).

Altera forma ad *S. Carlos*, supra muscos repens, folia habuit rufa, facie superiore plus minus celluloso-muriculata; perianthia apice subobcordato crebre spinulosa.

7. PRIONO-LEJEUNEA MACROCARDIA, Spruce.

Hab. In M. *Campana*, Andium Peruviæ, in cortice vetusto.

F ·35 × ·3, *lob* ·13, *c* $\frac{1}{5}$–$\frac{1}{10}$; *br* ·2; *per* 1·0 × ·5^{mm}.

Pusilla pallida dein fuscidula, *L. microlontæ* et *leptocardiæ* valde affinis, sed differt: foliis multo minoribus, latioribus, semiovato-rotundis, basi dilatatis subsemicordatis, apice abrupte acutis obtusisve raro rotundatis, obliquis (margine postico tamen rotundato, nec subrecto vel concavo ac in illis), subplanis celluloso-serrulatis, ad lobuli turgidi subsaccati apicem magis sinuatis; cellulæ, marginalibus conicis exceptis, subplanæ, incrassatæ.

Foliola minuta, foliis 5-plo minora, caule vix latiora, orbiculata, ad $\frac{1}{2}$ bifida.

Flores monoici: ♀ in ramulo brevissimo terminales, innovatione (sæpe ♂) suffulti. Bracteæ parvæ profunde bilobæ, lobo falcato semiovali muricato-denticulato, lobulo parvo lineari; bracteola obovato-lanceolata ad $\frac{1}{2}$ fere bifida.

Perianthia pro plantula magna, foliis fere triplo longiora, anguste obcordato-cuneata, apice profundiuscule emarginata brevirostria, margine supra medium inæqualiter spinulosa, spinulis 3–4 cell. longis basi 1–3 cell. latis, antice subplana, postice obtuse unicarinata convexave.

Andrœcia rami apicem—raro totum—tenentia; bracteæ 4–6 jugæ.

L. leptocardia folia habet duplo longiora, pro ratione angustiora, facie insigniter muriculata; foliola duplo majora ovali-rotunda; perianthia tamen breviora foliis caulinis perpaulo longiora, distincte alata, minus profunde emarginata.—Anne pro *L. microdontæ* varietate habenda *L. macrocardia?* Statura minor, foliola minuta, præcipue autem perianthia magna distincte obcordata margine valide spinulosa vetant.

8. PRIONO-LEJEUNEA LEPTOCARDIA, Spruce.

Hab. Andes Peruvianos, in M. *Guayrapurina*, supra filices, in M. *Campana* ad cortices; in M. *Chimborazo* in filice, cum aliis *Prionо-Lejeuneis* implexa.

F ·65 × ·50, *lob* ·2, *c* $\frac{1}{10}$; *fl*^{a} ·15 × ·15; *br* ·5–·6; *br*^{la} ·4 × ·25, ·3 × ·18; *per* ·7 × ·5, ·8 × .55^{mm}.

Pusilla pallida tenera pellucida. Caules $\frac{1}{4}$-pollicares prostrati pinnatim subramosi.

Folia pro plantula magna subimbricata, late semiovata, fere semicircularia, abrupte acuta, obtusa, rotundatave, a basi constricta sublongitudinali antice valde dilatata, utraque facie (basin versus exceptâ) margineque toto (basi posticâ exceptâ) argute celluloso-muriculata, infra medium recte complicata, plica subhorizontali; lobulus 3-plo minor semiovatus inflatus, apice occulto, interdum obsoletus; cellulæ parvulæ subæquilateræ conico-prominulæ, basin versus tamen longiores subplanæ.

Foliola foliis 4-plo minora, caule parum latiora, ovali-rotunda, ad vel paulo ultra medium bifida, subintegerrima.

Flores monoici; ♀ in ramo perbrevi longioreve terminales, innovatione sæpe ♂ vel ♀—raro neutrâ—suffulti. Bracteæ foliis minores oblique anguste spathulatæ obtusæ muricato-denticulatæ, elobulatæ vel altera parvilobulata; bracteola brevior ovali-lanceolata, ad medium bifida, rima angusta, segmentis acutatis.

Perianthia altiuscule emersa anguste obcordato-cuneata, valde compressa, postice obscure unicarinata, supra medium ala pellucida 3–4 cell. lata serrulata crenulatave utrinque marginata, exindeque ad speciem spathulata.

Andrœcia brevia vel subelongata, ramulum totum sæpius tenentia; bracteæ sub 6-jugæ—raro longe numerosiores usque ad 20-jugæ.

Ab hac certe differt *L. microdonta* foliis lævibus sinuato-complicatis, lobulo subbreviore turgidiore; bracteis distincte lobulatis; bracteola solum ad $\frac{1}{5}$–$\frac{1}{3}$ bifida; perianthio postice altius carinato, apice parum emarginato, margine solum muriculato spinulosove (nec alato).

9. PRIONO-LEJEUNEA? SCABERULA, Spruce.

Hab. Ad. fl. *Negro* juxta *Marabitanas* (pl. ♀), fl. *Uaupés* ad *Panuré* (pl. ♂); in cortice vivo, aliis *Lejeuneis* immixta.

F ·4×·35, *lob* ·125; *c* $\frac{1}{40}$–$\frac{1}{35}$; f^{la} ·2×·15, ·15×·15; *br* ·5; br^{la} ·45×·25^{mm}.

Pusilla pallida prostrata. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicares tenues flexuosi pauciramei.

Folia parum imbricata ad insertionem insigniter constricta (quasi-stipitata), ad lobuli carinam semierecta, dein abrupte divergentia, decurvo-concava oblique late ovata, rotundata, obtusa, vel abrupte subacuta, celluloso-erosa-serrulatave, facie externa asperula, infra medium valde sinuato-complicata—margine supra sinum valde rotundato; lobulus folio 3-plo fere brevior, saccatus oblique ovatus, margine involuto; cellulæ parvulæ guttulatæ, pariete incrassato, nisi pro annulo chlorophylli angusto pellucidæ, marginales superioresque acute, cæteræ obtuse conico-prominulæ.

Foliola inferiora dissita, superiora contigua increscentia, foliis duplo breviora, rhombeo-rotunda, paulo ultra $\frac{1}{2}$ acute bifida, segmentis acutis.

Flores dioici: ♀ in caule ramove innovando-prolifero terminales. Bracteæ foliis sublongiores, suberectæ obovatæ concavæ, basi lobulo parvo lineari auctæ; bracteola obovato-rhomboidea, ad $\frac{1}{3}$ bifida, segmentis acutis, margine supero angulato: omnes muricato-serrulatæ. Perianthia . . . .

Andrœcia ramulo duplum folium caulinum æquante crasse julaceo constantia; bracteæ foliis duplo minores 5–8-jugæ turgidæ.

Species dubiæ affinitatis, dum perianthia incognita restant, inter *Prionо-Lejeuneas*, *Trachy-Lejeuneas* et *Crossoto-Lejeuneas* vacillans.

10. PRIONO-LEJEUNEA? ASPERRIMA, Spruce.

Hab. Tauaú propre *Pará*, in trunco putrido, supra alias *Lejeuneas* repens; ex aliis locis sylvæ Amazonicæ pauca specimina simili modo parasitantia—semper fœminea steriliaque—carpsi.

F ·25×·18, *lob* ·1, *c* $\frac{1}{60}$; f^{la} ·4–5 *c. longa*; *br* ·5; br^{la} ·40–·45×·2^{mm}.

Minuta viridis prostrata, *radicellis longis* (paucis ad cujusque folioli basin) patentibus v. subfasciatis adfixa; caules $\frac{1}{8}$ pollicares filiformes vage pauciramei fragiles.

Folia dissita subcontiguave, suberecta (axi a caule parum divergente) obovato-rotunda vel, ad lobuli apicem constricta, spathulata, medium versus profunde sinuato-complicata, subconcava, margine toto insigniter *muricato-serrulata*, facie *asperrima;* lobulus dimidium folium fere æquans, extus rotundatus, saccatus, late semiovatus vel fere hemisphæricus, margine fere transverso incurvo apice occulto; cellulæ minutulæ subpellucidæ extus alte *conico-prominulæ*, paucæ versus folii basin subplanæ.

Foliola minuta bipartita, cruribus conniventibus divergentibusve subulato-acuminatis, basi 2–3 cellulas latis, integerrima, lævia.

Fl. dioici: ♀ terminales, innovatione suffulti. Bracteæ magnæ, foliis duplo longiores, patulæ, apice incurvæ, oblique obovatæ ovalesve, subacutæ, ad medium bifidæ, vix complicatæ, asperrimæ, lobulo parvo apice lanceolato; bracteola parum brevior ovali-ligulata ad $\frac{1}{3}$ acute bifida, segmentis acutis.

Plantula pulcherrima, quoad foliola bicrura Drepano-Lejeuneis similis;

quoad folia valde diversa, Priono-Lejeuneis et Trachy-Lejeuneis magis propinqua; forsan pro subgenere proprio habenda.

† PRIONO-LEJEUNEA SCHIMPERI, Gottsche in hb. Schimp.

Hab. Mexico (Hb. Schimper, sine nomine collectoris).

Depresso-cæspitosa albicans pellucida, magn. *L. microdontæ*. Caules pollicares procumbentes elongati laxe pinnatim ramosi.

Folia subimbricata tenuia tenera oblique semicordato-ovata subfalcata rotundata, rarius solum obtusa, decurvo-concava, e cellulis prominulis crenulata, vel caulina fere integerrima; lobulus 3-plo minor ovoideus turgidus; cellulæ majusculæ, inferiores sensim majores, convexulæ, ocello nullo.

Foliola duplo minora rhombea ad $\frac{1}{5}$ biloba, segmentis subacutis, medio margine utrinque interdum in dentem prominula.

Fl. dioici: ♀ terminales, innovatione (sæpe prolifera) suffulti. Bracteæ foliis 2-plo majores fornicatæ, lobulo lobo duplo minore explicato, crenulatæ; bracteola vix brevior, foliolis subconformis.

Perianthia emersa, obcordato-triangularia compressula incurva, subtus late unicarinata (e carinis 2 in unam lanceolatam confluentibus), margine complanato inæqualiter spinulosa setulosave.

Androecia cylindracea; bracteæ haud confertæ, majusculæ, 2-andræ.

SUBGENUS XIX.—*CROSSOTO-LEJEUNEA*, S.

Plantæ late depresso-cæspitosæ parvulæ concinnæ amæne-vel albido-virides, siccando tam forma quam colore fere immutatæ. Caules subpinnati, ramis ascendentibus rectiusculis.

Folia parum imbricata, supra plicam brevem divergentia, oblonga v. subovata, apice decurvo tortili acuta acuminatave celluloso-crenulata sæpeque apice subdenticulata, facie subpapulosa; lobulus parvus inflatus, rarius obsoletus; cellulæ convexulæ interdum verruculosæ, pariete subincrassato, mediæ diametro $\frac{1}{50}$–$\frac{1}{30}$ mm.

Foliola subsquarrose patula dissita foliis 2-(raro 3-) plo breviora cuneata v. suborbiculata, crenulata, ad $\frac{1}{2}$–$\frac{3}{4}$ bifida, sinu sæpe lato obtuso, segmentis acutis acuminatisve, nonnunquam utrinque medio unidentata.

Flores monoici, ramo ♀ innovando-prolifero homotropo. Bracteæ folia subæquantes, integerrimæ v. sæpius denticulatæ, complicatæ parvilobulatæ; bracteola ovali-lanceolata ad $\frac{1}{4}$–$\frac{1}{2}$ bifida, segmentis acuminatis, denticulata spinulosave.

Perianthia pyriformia subcompressa 4–5-carinata, carinis superne alâ inciso-serratâ spinulosâve fimbriatis.

Amenta ♂ ramulo tenui cauligeno constantia, bracteis 3–6 jugis.

Hab. In arborum truncis, tam vivis quam putrescentibus, in ramulis frequens, nunquam in foliis; per totam planitiem, in montibus nullibi visa.

Distr. Species sub 6 nobis cognitæ omnes neotropicæ, insulis Antillis, Guiana et Amazonia incolæ; quarum 3 (duas novas) ipse legi. *L. Boryana* Mont., antea ins. Dominica lecta, sylvæ Amazonicæ plurima loca habitat.

A. *Monoicæ. Foliola profunde (ad ¾) bifida, segmentis subdivergentibus.*

1. *C.-L. Boryana.* F. semicordato-elliptica valide sinuato-complicata, lobulo 4-plo breviore turgido, cellulis papulosis minute verruculosis scaberula. Foliola utrinque valide unidentata. Br. lobulo = ½ lobum. Per. subcompressa 5-carinata, carinis superne alatis, ala arcte inciso-serrata-spinosave.

2. *C.-L. paucispina.* F. ovato-oblonga recte complicata, lobulo parvo sæpe obsoleto, lævissima. Foliola utrinque sæpius edentata. Br. lobulo lobo 5-plo breviore. Per. magis compressa 4 carinata, carinis apice peranguste alatis spinisque paucis valde deciduis armatis.

B. *Dioicæ. Foliola vix ad ½ bifida, segmentis incurvis.*

3. *C.-L. torticuspis.* F. oblonga subacuta, lobulo parvulo turgido. Foliola oblato-orbiculata.

1. CROSSOTO-LEJEUNEA BORYANA, Mont.

Hab. In sylva Amazonica tota, secus fl. *Negro* præcipue, frequens, in truncis vetustis cariosisve, interdum etiam in radicibus emersis; in montibus nullibi visa. In insulis Antillis.

F ·5 × ·25, *lob* ·13, *c* $\frac{1}{48}$, *basales* $\frac{1}{24}$; *f*^{la} ·3 × ·3, ·25 × ·25; *br* 6; *br*^{la} ·5 × ·3; *per* ·65 × ·4^{mm}.

Pusilla viridis vel albido-viridis, dense depresso-cæspitosa. Caules ½–1-pollicares prostrati, subpinnatim ramosi, interdum decompositi, ramis assurgentibus.

Folia laxe imbricata vel solum contigua, fragilia, divergentia, oblique semicordato-elliptica, apice sinuato-decurvo tortilive acuta vel subacuminulata—inferiora interdum obtusa—celluloso-crenulata, alia superne obsolete denticulata, facie (ad sacculum præcipue) papulosa, margine postico infra medium profundissime sinuata dein complicata; lobulus folio 4-plo brevior ovatus saccato-inflatus exciso-acutus raro obsoletus; cellulæ parvulæ, pellucidæ guttulatæ, convexulæ et minute verruculosæ, pariete subincrassato, marginem anticum versus minores, ad et infra medium duplo majores pellucidioresque.

Foliola foliis vix duplo breviora, subdissita, squarroso-patentia, late cuneata, profunde (ad ¾) bifida, sinu lato triangulari vel lunulari, laciniis subangustis acuminatis, extrorsum utrinque valide 1-dentata, interdum subcrenulata

Flores monoici: ♀ in ramo sæpe brevi, innovando-elongato, raro tamen iterum florifero, terminales. Bracteæ foliis sublongiores patulæ bilobæ, lobis acuminulatis integerrimis vel denticulatis, antico lanceolato, postico subduplo minore trapezoideo vel obtriangulari; bracteola appressa ovali-lanceolata ad medium fere bifida, segmentis acuminatis, denticulata vel subspinulosa.

Perianthia subemersa, pyriformia vel obpyramidata, subcompressa, ex apice subretuso rostellata, 5-carinata, carinis superne late alatis, ala crebre spinosa vel inciso-serrata.

Andrœcia ramulo brevi, folio collaterali æquilongo, constantia; bracteæ 3–5-jugæ, laxiusculæ, foliis caulinis subduplo minores.

Var. *concinna.* Folia magis conferta, ad ⅓ lat. imbricata, siccando valide decurva, magis acuminulata, margine supero haud raro dente uno

alterove majusculo aucta. Foliola subimbricata, laciniis extus valide unidentatis—quasi inæqualiter bilobis—margine eroso-subdenticulata. Perianthia contra minus armata sunt.—*Hab.* Fl. *Uaupés.*

2. CROSSOTO-LEJEUNEA PAUCISPINA, Spruce.

Hab. Fl. *Negro*, in truncis putridis ad *S. Gabriel* et riv. *Cauapuna;* in arborum ramulis ad fl. *Bombonasa.*

F ·75 × ·5; *lob* ·2–·08; *c* $\frac{1}{3\cdot0}$; *f*^{la} ·3 × ·35, ·3 × ·25, ·25 × ·25; *br. lob* ·6 × ·25; *br*^{la} ·5 × ·25; *per* 1·0 × ·5^{mm}.

Tenella viridis, interdum pallida v. subolivacea late repens. Caules 1–2-pollicares debiles pinnati et subbipinnati, sæpe valde intricati, ramis inæquilongis. Folia parum imbricata subplana oblique ovato-oblonga abrupte acuta acuminulatave rarius minute apiculata, obtusa, rotundatave, integerrima vel lenissime celluloso-crenulata apiceque eroso-denticulata, subrecte complicata; lobulus parvus, folio 4–10-plo brevior basi decurrens quadratus (sed e margine incurvo ovoideus) sæpe subobsoletus; cellulæ mediocres subæquilateræ leptodermes, centro pellucidæ, ambitu opacæ, planæ, marginales autem cæteris multo minores interdum subprominulæ.

Foliola dissita, $\frac{1}{2}$ folium vix æquantia late cordato-orbiculata profunde (ad $\frac{3}{4}$) bifida, segmentis subdivergentibus acuminatis, utrinque medio margine 1-dentata v. sæpissime integerrima.

Flores monoici: ♀ in ramo brevi, sæpe iteratim prolifero (subtrifloro), terminales. Bracteæ foliis subbreviores oblique lanceolatæ margine antico denticulatæ v. sæpe grosse 3-dentatæ, lobulo 5-plo breviore rhombeo linguæformive; bracteola minor oblonga v. ovali-lanceolata ad $\frac{1}{3}$ bifida, segmentis acuminatis.

Perianthia foliis longiora obconico-pyriformia sat compressa, apice obcordato brevirostria, antice depressa postice bicarinata, margine carinisque apice subalatis parce spinosa, spinis valde deciduis.

Andrœcia brevispica cauligena, folio breviora v. sublongiora; bracteæ 3–6-jugæ parvæ.

Var. *rufescens*: foliis omnibus distincte lobulatis; perianthiis longioribus subclavatis; andrœciis sæpe elongatis.—Ad fl. Bombonasa.

A *L. Boryana* certe differt caule longiore regulariter pinnato; foliis parvilobulatis ad lobuli apicem vix sinuatis, cellulis leptodermibus; foliolis orbiculatis; perianthiis multo minus cristatis.

3. CROSSOTO-LEJEUNEA TORTICUSPIS, Spruce.

Hab. In fl. *Negro* sylvis, ad *S. Gabriel*, aliis hepaticis irrepens; secus riv. *Tarumá*, ad arborum ramulos; pl. ♀ sola sterilis.

F ·65 × ·45, ·6 × ·4; *lob* ·1–·15; *c* $\frac{1}{4\cdot0}$; *f*^{la} ·3 × ·35, ·2 × ·3; *br. lob* ·5^{mm}.

Pallida, siccando rufo-fusca, prostrata. Caules 1–2-pollicares flexuosi pinnatim ramosi, intexti.

Folia subimbricata, a basi plicatâ patente, subdivaricata, oblique late oblonga ovatove-oblonga, interdum basi subsemicordata, apice decurvo tortili subacuta, raro apiculata v. rotundata (ramea longiora acutioraque), margine fere toto celluloso-crenulata, apicem versus angulata v. subdenticulata; lobulus 4–6-plo brevior decurrenti-sac-

catus turgide ovatus apice inflexo occulto; cellulæ parvulæ pellucidæ guttulatæ, pariete parum incrassato, marginales obtuse v. acute prominulæ, cæteræ subplanæ.

Foliola dissita subsquarrosa foliis 2–3-plo breviora, oblato-orbiculata subcordata, apice incurvo fere ad ½ bifida, segmentis acutis acuminulatisve, subcrenulata.

Flores dioici: ♀ in ramo terminales, innovatione suffulti. Bracteæ foliis breviores, erectæ, undulato-crispæ, ad ½ complicato-bilobæ, grosse denticulatæ v. subspinulosæ, lobis lanceolatis subacuminatis subæquilongis, inferiore duplo angustiore; bracteola æquilonga ovali-lanceolata ad ¼–⅓ bifida, segmentis incurvo-tortilibus acuminulatis, denticulata.

Forsan a *L. involuta* G. Syn. Hep. 350, diversa, cui adsunt folia "ovato-acuminata," bractearum lobuli breviores truncati, et bracteola utrinque bracteis connata. Species hæcce duæ transitum ad *Strepsi-Lejeuneam* et *Harpa-Lejeuneam* præbent.

SUBGENUS XX.—*HARPA-LEJEUNEA*, S.

Plantæ pusillæ pallide virides, post siccationem difficillime emollitæ, depresso-cæspitosæ. Caules tenues, tenaces tamen nec facile rupti, arcte repentes, vage v. subpinnatim ramosi, ramis sæpe assurgentibus apice decurvis.

Folia laxiuscula sæpissime divergentia hamataque v. saltem fornicato-concava (solum in *L. spinuliflora* subplana) oblique ovata, longiora quam lata, plus minus acuminata, raro obtusa rotundatave, integerrima v. celluloso-crenulata serrulatave, lævia, v. cellulis (superioribus præcipue) obtuse acuteve prominulis exasperata, lobulo majusculo turgido, rarissime obsoleto, aucta; cellulæ parvæ v. etiam præminutæ ($\frac{1}{40}$–$\frac{1}{80}$ mm) sæpius leptodermes, subpellucidæ, in aliis speciebus paucæ suprabasales cæteris majores subvacuæ ocellum sistentes.

Foliola minuta foliis 3–7-plo minora, vel (in *Cardiostipis*) cuneata obcordato-emarginata bifidave, segmentis rotundatis, vel (in *Cyclostipis*) rotunda, ad ½ bifida, segmentis acutis obtusisve—in unica sp. integra.

Flores in *Cardiostipis* omnibus dioici, in *Cyclostipis* plurimis monoici: ♀ in ramo brevi terminales, innovatione plerumque simplice, raro iterum innovante, suffulti, rarissime dichotomiales. Bracteæ lobulatæ, raro complicatæ, solum concavæ carinatæque (in *Cardiostipis* ad carinam alatæ) integerrimæ v. celluloso-crenulatæ-serrulatæve, rarissime denticulatæ; bracteola angusta biloba—in paucis sublatior et truncato-retusa-emarginatave.

Perianthia sæpe pro plantula maxima, 2–3-plo longiora quam lata, plerumque pyriformia, parum compressa, 5-carinata, carinis lævibus v. celluloso-scabris, in paucis spinoso-alatis, brevirostria.

Androœcia amentulis cauligenis folium proximum subsuperantibus constantia, rarissime in ramis terminalia; bracteæ sæpius paucijugæ parvæ, 1–2-andræ.

Hab. In sylvis opacis humidis, tam planitiei quam montium, in cortice, rarius in foliis vivis et in truncis putridis, fere constanter aliis hepaticis, Frullaniis et Lejeuneis præcipue, irrepentes.

Distr. Per totam sylvam Amazonicam adusque juga Andium subalpina (alt. 3000m.) obviæ, nusquam copiosæ, e minutie facile prætervisæ. Species 20 legi (13 Cyclostipas, 5 Cardiostipas, 2 Strepsi-Lejeuneas).— *L. ovata* Tayl., species Europæa unica, idem ac congeneres Austro-Americanæ, in Frullaniis sæpe parasitans—nunc autem rupestris—invenitur. E tota America tropica et australi, ad Cap. Horn usque, aliæ plurimæ species descriptæ sunt, sc. *L. stricta* L. et G., *L. semiscabrida* G., *L. Leiboldiana* G., *L. Raddiana* Lindenb., *L. Schlimiana* G., *L. Neesii* Mont. etc. Ex Asia tam continentali quam insulari nullam (quantum scio) speciem tenemus; paucas tamen ex insulis Mascarenis, sc. *L. Delessertii* Mont., *L. conformis* Mont., *L. trichomanoides* M. et N., et ex ins. Auckland 2, nempe *L. latitans* H. f. et T. et *L. Mimosa* Tayl.

§ 1. CARDIOSTIPA, *foliolis cuneato-obcordatis-bifidisve, angulis segmentisve obtusissimis. Flores omnium dioici. Bracteæ in omnibus*, L. pilifera *excepta, ad carinam alatæ.*

A. *Foliola apice solum retusa emarginatave.*

1. *H.-L. diaphana.* Pallida pellucidissima. F. subimbricata late semiovata obtusata valde fornicata; lobulus 2–3-plo brevior turgidissimus; c. parvulæ subprominulæ. Foliola foliis 3–4-plo breviora cuneato-rotunda retusa. Br. hamato-incurvæ acutæ lobulatæ vix complicatæ, ad carinam angustissime alatæ; bracteola ligulata subemarginata. Per. obovato-oblonga rotundata longirostria, alte 5-carinata.
2. *H.-L. Cinchonæ.* F. subimbricata arcuata semiovalia obtusa subacutave valde sinuato-complicata; lobulus fere 3-plo brevior ovato-fusiformis; c. parvæ planæ. Foliola foliis 5-plo breviora cuneato-reniformia retuso-emarginata. Rami ♀ sæpe dichotomi. Br. maximæ erectæ subcomplicatæ, ad carinam alatæ, lobo subacuto, lobulo paulo minore sæpe emarginato; bracteola obovato-oblonga subtruncata. Per. alte emersa pyriformia argute 5-carinata, carinis peranguste alatis apiceque spinis 2 v. 3 armatis.

[*H.-L. ovata.* F. subimbricata hamata falcato-lanceolata—rarius ovato-lanceolata—sensim acutata subpapulosa, basin versus parvi-ocellata sinuato-complicata; lobulus fere 3-plo brevior turgide ovoideus papulosus; cellulæ minutulæ subopacæ. Foliola 5-plo minora prælate obcordato-triangularia, sinu lato angulisque obtusis. Br. foliis ½ longiores incurvæ complicatæ ad carinam subalatæ, lobo lanceolato acuto, lobulo breviore obtuso; bracteola obovato-cuneata fere ad ¼ emarginato-bifida, segmentis rotundatis.—Europa.]

[*H.-L. parasitica.* Est quasi *L. ovatæ* forma minor. F. planiora ovato-triangularia acuminata acuta, ocellata, subrecte complicata; lobulus major, ½ folium excedens, ovato-fusiformis. Foliola iis *L. ovatæ* fere conformia.—Amer. Austr. ad Cap. Horn].

3. *H.-L. ancistrodes.* Pellucida flaccida. F. imbricata falcato-divergentia ovali-lanceolata acuminata acuta, acumine uncinato, obscure crenulata, ocellata, valde sinuato-complicata; lobulus ½ folium fere æquans anguste ovoideus; cellulæ parvulæ. Foliola foliis 2½-plo minora late obcordato-cuneata carinata, sinu lunulari, angulis obtusatis. Fl. ♀ dichotomiales. Br. foliis fere duplo longiores incurvæ complicatæ, ad carinam anguste alatæ, lobo acuminato, lobulo minore obtusato v. apice bifido; bracteola basi utrinque cum bracteis con-

nata, cuneato-oblonga ad $\frac{1}{5}$–$\frac{1}{4}$ acute bifida, segmentis obtusatis. Per. vix emersa obovata alte 5-carinata apice depresso brevirostria, carinis parcissime papulosis.

B. *Foliola ad $\frac{1}{2}$ usque biloba.*

4. *H.-L. tenuicuspis.* Viridis vel cœrulescens. F. dissita hamata divergentia, valde oblique ovato-lanceolata cuspidato-acuminata, vix subcrenulata, ocellata, valde sinuato-complicata; lobulus plus 3-plo brevior turgidus raro obsoletus; cell. minutulæ subprominulæ. Foliola minuta, f. 8-plo breviora, late obovata subacute biloba, lobis rotundatis divergentibus. Br. parum incurvæ foliis $\frac{1}{2}$ majores complicatæ, ad carinam obscure alatæ acuminatæ, lobulo obovato-oblongo exciso-truncato; bracteola obovato-lanceolata emarginato-biloba, lobis rotundatis.

5. *H.-L. pilifera.* Pallida pellucida. F. subimbricata planiora oblique ovata, ex apice acuto piliformi-cuspidata, ocellata, valde sinuato-complicata; lobulus 4-plo brevior saccatus; cell. minutæ. Foliola foliis 6-plo minora subrotunda subacute biloba, lobis rotundatis. Br. foliis $\frac{1}{2}$ majores subincurvæ complicatæ exalatæ, lobo ovali cuspidato medio margine antico unidentato, lobulo minore apice dentato; bracteola ligulato-oblonga, ad $\frac{1}{4}$ bifida, sinu segmentisque acutis, subdenticulata.

§ 2. CYCLOSTIPA, *foliolis suborbiculatis, ad $\frac{1}{2}$ bifidis, segmentis acutis rarius obtusis; in unica sp. integris. Br. exalatæ.*

A. *Foliola perfecte integra.*

6. *H.-L. holostipa.* Dioica, minuta. F. subdissita fere erecta obovata fornicato-concava; lobulus magnus (= $\frac{1}{2}$ folii) turgidus fere hemisphæricus; cellulæ præminutæ. Foliola 3–4-plo minora 8–10 c. lata. Bracteola obcordato-orbiculata cochleata. Per. subturbinata turgida acute 5-carinata lævissima.

B. *Foliola usque (v. fere) ad medium bifida.*

a. *Fl. dioici. Per. lævia inermiaque.*

7. *H.-L. megalantha.* Minuta. F. distantia suberecta oblonga rotundata v. subacuta, celluloso-crenulata, subsinuato-complicata; lobulus = $\frac{1}{2}$ folii turgide saccatus; c. parvæ subplanæ, marginales prominulæ. Foliola 4-plo minora subrotunda segmentis acutis. Br. foliis duplo majores, lobis obovatis subapiculatis subdenticulatis, postico paulo minore; bracteola spatulato-ligulata ad $\frac{1}{3}$ bifida, segmentis acuminulatis, utrinque 1-dentata. Per. maxima obovata turgida alte 5-carinata lævia.

8. *H.-L. galeata.* F. caduca subimbricata tenerrima galeato-concava oblique semicordato-ovata obtusa raro subacuta valde sinuato-complicata; lobulus sub 4-plo brevior inflatus; c. parvulæ subplanæ. Br. foliis $\frac{1}{2}$ breviores fragiles, lobo late oblongo integerrimo, lobulo parvo; bracteola lanceolato-oblonga ad $\frac{1}{3}$ bifida. Per. alte emersa obconico-pyriformia, supra medium argute 5-carinata. Amenta ♂ minuta lateralia.

b. *Fl. monoici. Perianthii carinæ e cellulis prominulis tuberculoso muriculatæve, in aliis speciebus spinis armatæ.*

9. *H.-L. erectifolia.* Minuta. F. subcontigua erecta oblonga basi apiceque rotundata recte complicata; lobulus = $\frac{1}{2}$ folii inflatus apiculatus;

cellulæ præminutæ convexulæ. Foliola 3-plo minora ovali-orbiculata, segmentis subacutis. Br. foliis majores, lobo obovato; bracteola obovata breviter bifida, segmentis obtusis. Per. maxima pyriformia compressa 5-carinata lævia. Audr. terminalia.

10. *H.-L. subspatulata.* F. subimbricata fornicata, a basi angustâ spatulata rotundata obtusave crenulata, valide sinuato-complicata; lobulus 3-plo brevior saccatus; c. mediocres, marginalibus exceptis subplanæ. Foliola 6-plo minora, segmentis subacutis. Br. foliis ½ longiores eroso-serrulatæ, lobo semiobovato; bracteola late oblonga ad ¼ bifida. Per. subimmersa, pyriformi-oblonga superne 5-carinata, carinis papulosis apice prominulis.
11. *H.-L. gomphocalyx.* F. divergentia late semiovata abrupte acuta crenulata sinuato-complicata; lobulus 4–5-plo minor saccatus: c. parvæ, subapicales marginalesque prominulæ, cæteræ planæ. Br. foliis minores, lobo lanceolato acuto; bracteola lineari-cuneata ad ½ bifida, segmentis subacutis. Per. alte emersa lineari-prismatica compressa 5-carinata, carinis crebre papillosis.
12. *H.-L. trachygona.* F. ovata subacuminata subcrenulata sinuato-complicata; lobulus 4-plo brevior inflatus, foliorum inferiorum subobsoletus; c. parvæ, marginalibus exceptis, subplanæ. Foliola 5-plo minora obovato-rotunda, segmentis subobtusis. Br. foliis subminores, lobo lanceolato; bracteola cuneato-lanceolata ad ¼ bifida, segmentis subobtusis. Per. alte emersa pyriformia compressula 5-carinata, carinis compressis crebre papillosis muriculatisve.
13. *H.-L. asprella.* F. prælate semiovata acuta, facie margineque muriculata, valde sinuato-complicata; lobulus 4-plo brevior inflatus; cellulæ parvulæ conico-prominulæ. Foliola 6–7-plo minora subrotunda, segmentis subacutis. Br. foliis subminores vix complicatæ, lobo obovato-lanceolato; bracteola longe cuneata bifida. Per. alte emersa clavato-pyriformia tota facie supra medium crebre acute muriculata.
14. *H.-L. diversicuspis.* F. supra lobulum erectum hemisphæricum 2-4-plo breviorem (ad ramos interdum obsoletum) divaricata late ovata obtusata raro acuta, pulchre reticulata submarginata, supra medium crenulata; c. parvæ pellucidæ. Foliola 4-plo minora, segmentis acutis. Br. foliis æquilongæ, lobo ovali acuto; bracteola angusta cuneato-lanceolata ad ⅓ bifida, segmentis acutis. Per. emersa pyriformia compressula, carinis rudimentarie alatis inæqualiter crenulatis.
15. *H.-L. paratropa.* F. divergentia late ovata abrupte acuminata acuta vix crenulata valde sinuato-complicata; lobulus 3-plo brevior decurrens saccatus; c. subparvæ. Foliola 4-plo breviora cuneato-obovata vix ad ½ bifida, segmentis obtusis. Br. foliis minores, lobo obovato-lanceolato acuto; bracteola cuneato-ligulata vix ad ½ bifida, segmentis subobtusis. Per. alte emersa clavata alte carinata, carinis tuberculosis apice paucispinulosis.
16. *H.-L. spinuliflora.* F. longe distantia *subplana* oblonga sæpius rotundata, obsolete lobulata; c. subparvæ planæ. Foliola foliis 6–7-plo minora oblonga, segmentis late subulatis. Br. foliis subæquales, lobo obovato-lanceolato; bracteola oblongo-ligulata breviter bifida, segmentis acutis. Per. emersa pyriformia subcompressa, carinis spinis hamatis armatis.
17. *H.-L. acanthogona.* F. e lobuli parvi (folio 6-plo brevioris) saccati apice divergentia, late semicordato-ovata, obtusa subacutave;

lobulus 6-plo brevior v. obsoletus; c. mediæ mediocres, omnes subplanæ. Foliola 7-plo minora, segmentis subacutis. Bracteæ foliis 2-plo minores vix complicatæ, lobo ovali acuto; bracteola anguste oblonga vix ad $\frac{1}{2}$ bifida. Per. alte emersa cylindrico-oblonga compressula supra medium 5-carinata, carinis spinoso-cristatis.

18. *H.-L. blepharogona.* F. patula late semicordato-ovata rotundata sinuato-complicata; lobulus plus 3-plo brevior semiovato-rhombeus; c. parvæ subplanæ. Foliola 3-plo minora ovato-orbiculata, segmentis falcato-lanceolatis subobtusis. Br. foliis subminores subdenticulatæ, lobo obovato rotundato; bracteola cuneato-lanceolata ad $\frac{1}{3}$ bifida, segmentis subacutis. Per. emersa obovata turgida præalte 5-carinata, carinis ciliato-spinosis.

§ 3. STREPSI-LEJEUNEA, *fere pro subgenere peculiari habenda, a cæteris* Harpa-Lejeuneis *differt habitu robustiore; colore flavido; foliis apice acuminato decurvo-tortili subdenticulatis, cellulis validioribus, pariete insigniter incrassato; foliolis multo majoribus, dimidium folium æquantibus; andræciis conspicuis, bracteis magnis, sæpe plurijugis.* Flores monoici.

19. *H.-L. inflexa.* F. pellucida, c. mediis $\frac{1}{55}$—$\frac{1}{50}$ mm. Foliola sinu depresso, segmentis subacutis. Amenta ♂ longispica.
20. *H.-L. Gabrielensis.* F. opaca, c. $\frac{1}{65}$. Foliola plana, segmentis obtusatis. Amenta ♂ brevispica.

1. HARPA-LEJEUNEA DIAPHANA, Spruce.

Hab. Ad fluvium *Bombonasa*, alt. 400m, in folio vivo, cum *Frullania Beyrichiana.*

F ·55 × ·4, ·4 × ·3 : *lob* ·15; *c* $\frac{1}{40}$; f^{la} ·13 × ·13; *br* ·75 × ·55; br^{la} ·55 × ·2; *per* ·75 × ·5mm.

Pusilla pallida pellucidissima reptans. Caules $\frac{1}{4}$ poll. longi vage ramosi, ramis superne sensim parvifoliis.

Folia subimbricata—ramulorum sæpe dissita—late semiovata obtusata insigniter fornicata; lobulus triplo (foliorum rameorum vix duplo) brevior ovoideus turgidissimus, neque ad plicam deorsum saccatus vero iterum inflexus loboque appressus; cellulæ parvulæ æquilateræ leptodermes convexulæ valde diaphanæ, chlorophyllo parcissimo.

Foliola dissita, foliis caulinis 3–4-plo breviora, appressa, cuneato-rotunda retusa.

Flores dioici: ♀ terminales, innovatione suffulti. Bracteæ foliis dimidio longiores falcato-decurvæ subacutæ, carinatæ—vix complicatæ—carinâque angustissime alatæ; lobo oblique ovali; lobulo vix duplo breviore, 3–5-plo angustiore, tota fere longitudine lobo connato, apice solo in dentem brevem extante; bracteola brevior angusta ligulata, apice recurvo retusa emarginatave.

Perianthia vix emersa pellucida obovato-oblonga subcompressa alte 5-carinata, ex apice rotundato longius rostellata.

Pulchra species cum nulla alia confundenda; foliolorum forma, necnon bracteis alato-carinatis, cum *Harpa-Lejeuneis Cardiostipis* plane collocanda.

2. HARPA-LEJEUNEA CINCHONÆ, Nees. Syn. Hep. 342.

Hab. In M. *Tunguragua*, alt. 2000–2500m., corticola. In cortice Peruviano (Pauckert in hb. Hampe).

F ·4×·28 (*sine lobulo*) ×·35 (*cum lob.*); *lob* ·15; *c* $\frac{1}{50}$; f^{la} ·08×·12; *br* (*lob*) ·8×·4; br^{la} ·5×·3; *per* 1·2×·5^{mm}.

Pusilla pallida dense stratificata subcæspitosaque. Caules pollicares, basi subdenudata repentes, dein arcuato-assurgentes, foliosi, vage ramosi sæpe decompositi, ramis tamen paucis, dissitis, aliis dichotomis.

Folia laxe imbricata, basi assurgentia, apice devexa, sacculo basali ademto semiovalia v. semicircularia, subacuta vel sæpius obtusa, margine antico rotundato basi semicordato, postico ab apice fere ad $\frac{2}{3}$ long. usque recto horizontali, dein valde sinuato et in sacculum ovato-fusiformem, apice brevi (lobulo vero) acuto occulto patenteve, convoluto; cellulæ parvæ pellucidæ guttulatæ subincrassatæ planæ, chlorophyllo in sicco annulari.

Foliola distantia, foliis 5-plo minora, subplana, late cuneato-obovata reniformiave (latiora quam longa) late retuso-emarginata, angulis rotundatis.

Flores dioici: ♀ in ramorum dichotomiis, raro innovatione solitaria suffulti. Bracteæ maximæ, foliis 2-plo majores, erectæ, dimidiato-ovales, altera acuta altera obtusa, ad $\frac{1}{2}$ complicato-bilobæ, ad plicam anguste alatæ, lobulo $\frac{1}{3}$ breviore angustioreque rotundato sæpe marginato; bracteola bracteis longe brevior obovato-oblonga rotundato-truncata repandula subplana.

Perianthia emersa, f. caulinis 3-plo longiora pyriformia, v. fusiformia (basi attenuata), ab ipsa basi argute pentagona—vel potius pentaptera—angulis alâ angustâ 2 c. crassâ limbatis, apiceque spinis 2 v. 3 subulatis recurvulis (cornua simulantibus) armatis. Calyptra magna tenuis.

Planta pulchella, ex habitu et floribus dichotomialibus ad *Hygro-Lejeuneam catinuliferam* plane accedens, cæteris caracteribus valde diversa.

3. HARPA-LEJEUNEA ANCISTRODES, Spruce. (TAB. V.)

Hab. *Quisapincha*, prope *Ambato;* etiam super montem *Tunguragua*, alt. 3000^{m}., in arboribus vetustis, supra *Lejeuneam catinuliferam* repens.

F ·5×·35, *lob* ·2, *c* $\frac{1}{45}$; f^{la} ·2×·2; *br. lob* ·9×·5; br^{la} ·75×·5; *per* ·9×·5^{mm}.

Pusilla pallide viridis fragilis flaccida; caules $\frac{1}{4}$-pollicares prostrati pinnatim subramosi, ramis ♀ furcatis.

Folia tenerrima pellucida imbricata, falcato-divergentia, oblique ovali-lanceolata acuminata acuta, acumine decurvo-uncinato, caulem antice late transeuntia, integerrima vix obscure celluloso-crenulata, valde sinuato-complicata; lobulus $\frac{1}{2}$ folium fere æquans, anguste ovatus inflatus acutus, apice tamen sæpissime involuto; cellulæ parvulæ leptodermes, chlorophyllo parco in annulum congesto, paucæ (4–6) basin versus duplo majores vacuæ in ocellum plerumque aggregatæ.

Foliola subcontigua dissitave, foliis $2\frac{1}{2}$-plo breviora, late obcordato-cuneata, subcarinata, sinu lato lunulari, angulis obtusatis.

Fl. dioici: ♀ terminales, innovationibus 2 oppositis suffulti. *Bracteæ* foliis fere duplo longiores, patulæ decurvæ, paulo ultra medium complicato-bilobæ, ad carinam peranguste alatæ, ad sinum devexæ; lobi antici oblique lanceolati subacuminati acuti subintegerrimi; lobuli paulo breviores, sat angustiores, rhomboidei obtusati, alter sublatior sæpe bilobus; bracteola paulo brevior, *basi utrinque connata*, cuneato-oblonga ab apice ad $\frac{1}{5}$–$\frac{1}{4}$ alt. acute emarginato-biloba, segmentis obtusatis.

Perianthia vix emersa, obovata, alte 5-carinata, apice depresso brevirostellata, carinis apice rotundato-prominulis papillaque una alterave vix scaberulis.

Andrœcia cauligena, f. caulino æquilonga, compresso-globosa; bracteæ 2–3-jugæ majusculæ.

L. stricta L. et G. (Syn. Hep. 756) nostræ certe proxima, differre videtur caule stricto; foliis minus decurvis ovatis acuminatis; foliolis minutis; perianthiis brevioribus.—*L. ovata* Tayl. (a qua vix distincta videtur *L. stricta*) a *L. uncinata* diversa est foliis validioribus opacis, apice breviore vix acuminato, lobulo minore sed turgidiore, cellulis dimidio minoribus, ocello minore (2 cell. constante); foliolis duplo minoribus oblatis; bracteis conformibus duplo fere minoribus, basi utrinque cum bracteola connatis; innovatione floris fœminei unilaterali.

4. HARPA-LEJEUNEA TENUICUSPIS, Spruce.

Hab. In arborum truncis fl. *Negro* inundatis, sæpe cum aliis *Lejeuneis* immixta: pl. ♀ sterilis.

F ·4 × ·2; *lob* ·125; *c* $\frac{1}{60}$; f^{la} ·05 × ·07; *br. lob* ·6 × ·25; br^{la} ·4 × ·28^{mm}.

Pusilla, viridis, aliquando cœrulescens, siccando sublurida. Caules $\frac{1}{4}$-pollicares, vage ramosi, ramis sæpe elongatis flaccidis.

Folia dissita, patula, apice insigniter hamato-decurva, valde oblique ovato-lanceolata cuspidato-acuminata, cuspide sub 5 cell. longa, 1c. (basi 2c.) lata, repanda, integerrima v. parum celluloso-crenulata, basin versus (sub lobuli margine) ocellata, a basi (cum lobulo) saccatâ extus valde convexâ semierectâ, abrupte divergentia; lobulus plus 3-plo brevior late semiovoideus turgidus, margine inflexo parum obliquo, apice acuto occulto, raro obsoletus; cellulæ minutulæ vix paulo incrassatæ subprominulæ ambitu opacæ, ocelli 2 v. 3 c. cellulæ cæteris duplo majores vacuæ.

Foliola minuta foliis 8-plo breviora, oblato-obovata, ad $\frac{1}{2}$ fere subacute biloba, lobis divergentibus rotundatis.

Flores dioici: ♀ in ramo sæpissime perbrevi—raro longiore—terminales. innovatione unilaterali brevi simplice suffulti. Bracteæ erecto-patulæ, subplanæ (parum incurvæ) ad $\frac{1}{2}$ complicato-bilobæ, celluloso-crenulatæ, obiter subdenticulatæ, ad carinam acutam vix rudimentarie alatæ, lobo longe oblique lanceolato subacuminato raro subcuspidato acuto, lobulo fere duplo breviore obovato-oblongo exciso-truncato; bracteola sat brevior, obovato-lanceolata emarginato-biloba, sinu subacuto, apicibus rotundatis.

5. HARPA-LEJEUNEA PILIFERA, Spruce.

Hab. In sylva Amazonica, hic illic in cortice, rara vel ob minutie prætervisa, semper aliis hepaticis, *Lejeuneis* præcipue, irrepens: *Caripi* prope

Parâ; S. Carlos del Rio Negro; Marona-yacu prope *Tarapoto*, alt. 600m., in *Bryo-Lejeunea diffusa*.

F ·4 × ·2, *cuspis* ·1–·125, *lob* ·1, *c* $\frac{1}{60}$; f^{la} ·07 × ·07; *br. lobus* ·6 × ·3mm.

Pusilla pallida pellucida. Caules $\frac{1}{4}$-pollicares, vage vel subpinnatim ramosi, arcte repentes.

Folia vix ad lobulum usque imbricata, subplana vel decurva, oblique ovata, basi lata vix semicordata, ex apice acuto longe piliformi-cuspidata (cuspide 7 v. 8 cellulas longa) supra basin valide sinuato-complicata; lobulus 4-plo brevior, ovatus saccatus, margine apiceque involutus; cellulæ minutulæ subconformes leptodermes, fere vacuæ, 2 v. 3 inferiores (sub lobuli margine) cæteris duplo majores ocellum sistentes.

Foliola distantia minuta, foliis 6-plo minora, subrotunda, medio 6 cellulas lata, apice subacute bifida, segmentis rotundatis.

Flores dioici: ♀ in ramo brevi terminales, cum innovatione simplice. Bracteæ foliis dimidio majores, sæpe incurvæ, ad $\frac{1}{2}$ complicato-bilobæ; lobo antico oblique ovali plus minus cuspidato, medio margine antico sæpius unidentato, rarius etiam subdenticulato; lobulo duplo breviore angustioreque, apice vel spinuloso-tridentato vel acuminato et varie subdentato; bracteola brevior ligulato-oblonga ad $\frac{1}{4}$ bifida, sinu segmentisque acutis, margine repando vel subdenticulato.

L. L. Delessertii Mont., *Dominicensis* Mont., *Owaihiensis* Gottsch. et *cuspidata* Gottsch., omnes ut videretur nostræ affines, foliola habent multo majora, in *L. cuspidata* etiam acutiloba.

6. HARPA-LEJEUNEA HOLOSTIPA, Spruce.

Hab. Parâ, in cortice, supra *Frullaniam exilem* Tayl. aliasque hepaticas repens; etiam ad *Caripi* aliisque locis flum. Amazonum ostiis proximis.

F ·3 × ·2, ·25 × ·18; *lob* ·125; *c* $\frac{1}{80}$; f^{la} ·08 × ·08; *br* ·4 × ·3; br^{la} ·25 × ·25; *per* 5· × ·3mm.

Minuta, viridis, laxe effusa. Caules $\frac{1}{5}$–$\frac{1}{2}$-pollicares tenues flexuosi, in matrice paralleli, subsimplices v. parce vageque ramosi.

Folia subdissita fere erecta (axi à caule parum divergente) assurgentia fornicato-concava obovata, rotundata, dimidio inferiore toto cum lobulo in sacculum magnum valde turgidum (fere hemisphæricum), margine involutum, convoluta, dimidio superiore (lobulo ademto) fere orbiculata, cochleata; cellulæ præminutæ leptodermes convexulæ, ambitu opacæ, centro pellucidæ.

Foliola foliis 3–4-plo minora, distantia, rotunda integra, 8–10 cellulas lata.

Flores dioici: ♀ in ramo terminales, innovatione simplice suffulti. Bracteæ foliis majores obovato-rotundæ concavæ, ad $\frac{3}{4}$ bifidæ, lobulo parvo lineari explanato; bracteola bracteis brevior obcordato-orbiculata cochleato-concava.

Perianthia emersa obovata subturbinata, vix compressa, in rostellum subsensim angustata, acute 5-carinata, lævissima.

Androecia in ramis plerumque terminalia, raro basilaria; bracteæ pauci- (sub 4-) jugæ, *foliis caulinis imo majores*, oblique ovato-rotundæ complicatæ turgidæ apice subæquilobæ.

Foliolis perfecte integris a cæteris omnibus sui subgeneris distinctissima.—*Brachio-Lejeuneæ laxifoliæ*, Tayl. ex longinquo subaffinis.—Melius forsan, cum *H. L. erectifolia* et *megalantha*, inter *Micro-Lejeuneas* militaverit.

7. HARPA-LEJEUNEA MEGALANTHA, Spruce.

Hab. S. Carlos del Rio Negro, in arbore vetusta, supra alias *Lejeuneas* repens.

F ·25 × ·15, ·25 × ·125, *lob* ·125, *c* $\frac{1}{5\,5}$; f^{la} ·05; *br* (*explicata*) ·5 × ·4; br^{la} ·4 × ·2; *per* ·6 × ·35, ·55 × ·25^{mm}.

Minuta pallida; caules $\frac{1}{4}$-pollicares, filiformes, vage ramosi, implexi.

Folia longe distantia suberecta (axi a caule paulo divergente) oblonga obovatave rotundata, obtusa, vel abrupte acuta, basi rotundato-saccata, margine celluloso-crenata, medio subsinuato-complicata; lobulus (=dimidium folium) fere hemisphæricus, margine incurvo tamen suboliquo, turgidus, apice plerumque occulto, vel conspicuo et exciso; cellulæ subconformes, parvæ, pellucidæ, marginales papuloso-prominulæ. Folia ramea nunc elobulata, nunc (in ramis elongatis) ad sacculum basilarem solum fere radacta.

Foliola minuta folio 5-plo minora, caule haud latiora, subrotunda, ad medium subacute bifida.

Flores dioici: ♀ terminales, innovatione (plerumque simplice) suffulti; bracteæ maximæ, foliis duplo majores, divergentes, obovatæ subapiculato-acutæ et sæpius hic illic angulato-denticulatæ, breviter (ad $\frac{1}{3}$) bifidæ parum complicatæ, lobulo plus minus breviore angustioreque; bracteola spathulato-ligulata ad $\frac{1}{3}$ solum bifida, segmentis patulis acuminulato-acutis, sæpe utrinque 1-dentata.

Perianthia magna, foliis plus 2-plo majora, pellucida fuscidula, pyriformia, vix compressa, alte 5-carinata, carinis sublævissimis, rostello obsoleto.

Affinis *L. erectifoliæ* cui tamen sunt flores monoici; folia exacte erecta, cellulis præminutis opacis; foliola dimidio majora; bractearum minorum lobus obtusus integerrimus; bracteola obovata obtusiloba integerrima, et perianthia sat compressa.

8. HARPA-LEJEUNEA GALEATA, Spruce.

Hab. In M. *Campana* Andium Peruvianorum, ad saxa, alt. 1200^{m}; etiam in M. *Chimborazo*, ad corticem.

F ·6 × ·5, ·5 × ·5; *lob* ·13; *c* $\frac{1}{4\,0}$; f^{la} ·15; *br* 4; *per* 1·3 × ·5, 1·1 × ·6^{mm}.

Pusilla, e pallide viridi olivacea, plagas latas densas efformans. Caules $\frac{1}{3}$–1-pollicares flexuosi tenaces pinnatim ramosi subprostrati valde implexi, basin versus, e foliis caducis v. eorum lobulis solis relictis, plus minus denudati.

Folia subimbricata assurgentia—caulina sæpe squarrosa—basi angustâ subtransversâ inserta, unde facile soluta, fornicato-concava v. potius galeata, tenerrima, pellucida; valde oblique semicordato-ovata, apice deflexo obtusa rotundatave, raro subacuta, antice caulem late transeuntia, basi postica valde sinuato-complicata, lobulo sub 4-plo breviore ovato inflato, dente apicali conspicuo; f. ramea caulinis sæpe 2-plo minora; cellulæ parvulæ subæquimagnæ subplanæ.

Foliola foliis fere 4-plo minora, subrotunda, vix ad $\frac{1}{2}$ usque bifida, segmentis acutis subobtusisve.
Flores dioici: ♀ in ramo brevissimo terminales, innovatione brevi simplice suffulti. Bracteæ foliis $\frac{1}{2}$ breviores, fragiles, late oblongæ, lobulo parvo plano; bracteola lanceolato-oblonga ad $\frac{1}{3}$ bifida.
Perianthia alte emersa, foliis duplo longiora, obconico-pyriformia—demum elongata, clavata, quasi-stipitata—brevirostellata, supra medium alte argute 6-carinata, carinis complanatis lævissimis.
Andrœcia cauligena, folium collaterale subæquantia, bracteis 3–4-jugis.

Plantula singularis, e foliis arcuatis galeatis, basi valde constrictis ibidemque sæpe ad sacculum solum redactis, unde spatulata viderentur.

9. HARPA-LEJEUNEA ERECTIFOLIA, Spruce.

Hab. Fl. *Uaupés*, in arborum ramis, supra *Archi-Lejeuneam porelloidem* repens; etiam ad fl. *Negro* in *Radula pseudostachya*.

F ·25 × ·125, *lob* ·125, *c* $\frac{1}{80}$; *f*^{la} ·075; *br* ·325; *per* ·6 × ·35, ·75 × ·35^{mm}.

Minuta pallide viridis prostrata Caules $\frac{1}{8}$-pollicares tenuissimi vage vel pinnatim ramosi.
Folia contigua vel subdissita, fere longitudinaliter inserta, erecta (axi majore cauli parallela) oblonga, utroque fine rotundata (margine postico antico duplo fere longiore), recte complicato-biloba, ad carinam moniliato-papulosa; lobulus cætero folio subæquilatus, duplo brevior, inflatus, margine involuto, apice exciso-apiculato porrecto v. occulto; cellulæ minutissimæ conformes opacæ leptodermes guttulatæ papuloso-prominulæ.
Foliola foliis triplo minora, valde diaphana, ovali-orbiculata, ad $\frac{1}{2}$ bifida, sinu segmentisque subacutis.
Flores monoici: ♀ in ramo brevi terminales, innovatione suffulti. Bracteæ foliis majores obovatæ obtusæ, lobulo duplo breviore lineari-rhomboideo acuto; bracteola obovata breviter bifida, segmentis obtusis.
Perianthia pro plantula maxima, foliis triplo longiora, pyriformia subcompressa, postice bicarinata, antice apicem versus leviter carinulata, carinis repandis lævibus—demum (fructu emisso) basi elongata, subinfundibulata. Calyptra rufa ovali-fusiformis stipitata. Capsula globosa pallida.
Andrœcia in ramis terminalia, spicata; bracteæ 3–5-jugæ subrotundæ, cellulis prominulis scabræ, submuriculatæ.

Plantula facile distincta, affinitate inter *Harpa-Lejeuneas* et *Micro-Lejeuneas* media, melius forsan cum his collocata. Facie et magnitudine *L. holostipa* simillima est, cui tamen adsunt foliola perfecte integra, folia obovata, perianthia alte 5-carinata, etc. Planta Negrensis lobulum apiculo longiore recto donatum habet.

10. HARPA-LEJEUNEA SUBSPATHULATA, Spruce.

Hab. In Andium Quitensium radicibus, juxta fluv. *Bombonasa*, in cortice.

F ·45 × ·3 × ·2, *lob* ·18, *c* $\frac{1}{35}$; *f*^{la} ·075; *br* ·65 × ·4; *br*^{la} ·35 × ·3; *per* ·5 × ·25^{mm}.

Fusilla albescens, siccando fuscidula. Caules semipollicares repentes

subpinnatim ramosi, ramis confertis assurgenti-arcuatis subcæspitosis.

Folia subimbricata assurgentia, dein fornicato-decurva, ex angusta basi obovata spathulatave, rotundata obtusatave, celluloso-crenulata (rarius-serrulata), infra medium valide sinuato-complicata; lobulus folio vix triplo brevior semiovatus saccatus, margine obliquo involuto, apice abscondito; cellulæ mediocres subpellucidæ, inferiores sensim majores longioresque, submarginales solæ in conum obtusum acutumve prominulæ.

Foliola foliis 6-plo breviora, subrotunda, ad $\frac{1}{2}$ bifida, sinu segmentisque subacutis.

Flores monoici: ♀ in ramo perbrevi—raro longiore, vel in ipso caule terminales, innovatione simplice suffulti. Bracteæ foliis caulinis dimidio majores, ab apice ad $\frac{3}{4}$ alt. bilobæ, complicatæ vel sæpe non, muricato-erosulæ, lobo semiobovato vel semispathulato acuto vel obtuso, lobulo angustiusculo lanceolato; bracteola duplo fere minor, late oblonga, ad $\frac{1}{4}$ bifida, sinu latiusculo subacuto.

Perianthia subimmersa, anguste pyriformi-oblonga, supra medium 5-carinata, carinis papuloso-cristulatis, apice umbonato-prominulis—quasi rudimentarie cornutis.

Amenta ♂ ramulo foliis caulinis longiore constantia; bracteæ plerumque 5-jugæ, raro pluri-(10–20-) jugæ.

Foliis paulo densioribus, parum divergentibus, sæpe assurgenti-subsecundis, valde concavis, rotundatis obtusatisve, crenulatis; bracteis maximis; perianthiis parvis subimmersis; andrœciis longispicis; etc., a *L. tenuistipula* plerisque aliis ejusdem subgeneris differt.

11. HARPA-LEJEUNEA GOMPHOCALYX, Spruce.

Hab. Ad fluvium *Negro*, supra fl. *Casiquiari* ostia, in cortice.

F ·5 × ·4, ·4 × ·35, *lob.* 1, *c* $\frac{1}{50}$–$\frac{1}{40}$; f^{la} ·08 × .08; *br* ·4; br^{la} ·35 × ·15; *per* 1·0 × 3^{mm}.

Albida vel pallide viridis, siccando fuscescens, flaccida prostrata. Caules semipollicares teneri inæqualiter pinnati vel subbipinnati, ramis assurgentibus arcuatis.

Folia paululum imbricata, supra plicam basalem semiverticalem divergentia, valde decurvo-fornicata, late oblique semiovata abrupte acuta, margine toto celluloso-crenulata; lobulus folio 4–5-plo minor, decurrens, inflatus, ad plicam convexus, margine (ex involutione) transverso, apice occulto; cellulæ parvæ subæquilateræ pellucidæ, marginales obtuse prominulæ, cæteræ subplanæ, vel paucæ superiores convexulæ, ocello nullo.

Foliola minuta, foliis 5–6-plo breviora, rotunda cuneatove-rotunda, ad medium bifida, segmentis obtusis.

Flores monoici: ♀ in ramulo brevi terminales, innovatione simplice suffulti. Bracteæ foliis minores appressæ ultra medium bifidæ, lobo oblique lanceolato acuto, lobulo lineari apice subulato; bracteola lineari-cuneata ad $\frac{1}{4}$ bifida, segmentis acutis obtusisve.

Perianthia alte emersa, foliis caulinis duplo longiora, lineari-prismatica vel subclavata rotundato-truncata brevirostria, compressa 5-carinata, carinis crebre papillosis.

Andrœcia ramulo brevi, folio caulino æquilongo, constantia; bracteæ 3–4-jugæ.

Ab hac distat *Harpa-L. trachygona* textura firmiore (minime flaccida); foliis caulinis subelobulatis, rameis subacuminatis, minus distincte crenulatis; perianthiis brevioribus (pyriformibus nec claviformibus), carinis altioribus asperrimis.

12. HARPA-LEJEUNEA TRACHYGONA, Spruce.

Hab. In monte *Pingullu*, supra pagum *Tavalosos* Andium Peruvianorum, in cortice.

F ·4×·3, ·43×·35, *lob* ·1 v. 0, *c* $\frac{1}{50}$; f^{la} ·08×·08; *br. lob* ·35×·15; br^{la} ·3×·1; *per* ·65×·35^{mm}.

Pusilla cæspitoso-procumbens, ex olivaceo-viridi rufula; caules $\frac{1}{4}$-pollicares flexuosi inæqualiter pinnati, ramis sæpe arcuatis.

Folia parum imbricata late patula apice decurvula (ramorum fornicata) oblique ovata acuta subacuminatave repandula celluloso-subcrenulata, caulina basi obscurissime complicata (vel non), ramea caulinaque superiora plerumque abrupte sinuato-complicata; lobulus folio 3–4-plo brevior subovatus extus rotundatus; cellulæ subconformes parvæ pellucidæ leptodermes.

Foliola distantia, minuta, foliis 5-plo minora obovato-rotunda fere ad medium bifida, segmentis subobtusis.

Flores monoici: ♀ in ramo perbrevi terminales, innovatione simplice suffulti. Bracteæ foliis subminores, appressæ, ad medium bifidæ, acutæ, lobo lanceolato, lobulo parvo lineari-lanceolato; bracteola cuneato-lanceolata, 3-plo longior quam lata, ad $\frac{1}{4}$ acute bifida, segmentis acutis.

Perianthia alte emersa, foliis dimidio majora, pyriformia, compressula, pellucida, brevi-rostellata, 5-carinata, carinis compressis crebre muriculatis papillosisve.

Amenta ♂ cauligena, folio caulino æquilonga; bracteæ 4-jugæ, mediocres, 1–2-andræ.

13. HARPA-LEJEUNEA ASPRELLA, Spruce. (TAB. V.)

Hab. In M. *Guayrapurina*, Andium Peruviæ super truncos putridos.

F ·4×·35; *lob* ·1; *c* $\frac{1}{40}$; f^{la} ·06; *br* ·35; *per* ·6×·25^{mm}.

Pusilla, albescens, late dense cæspitosa. Caudex repens matrici arcte adfixus, caules $\frac{1}{8}$–$\frac{1}{4}$-poll. fastigiato-cæspitosos arcuantes parum ramosos, raro subpinnatos, edens.

Folia subimbricata valde hamato-decurva a basi angusta prælate semiovata acuta, facie margineque celluloso-echinata-denticulataque, basin versus valde sinuato-complicata, lobulo 4-plo breviore ovato inflato; cellulæ parvulæ æquilateræ, omnes fere insigniter conico-prominulæ, marginales anticæ sensim minores, subbasales submajores planioresque.

Foliola minuta foliis 6–7-plo breviora patula subrotunda ad $\frac{1}{2}$ bifida subacuta.

Flores monoici: ♀ terminales, cum innovatione. Bracteæ foliis subminores bilobæ, raro complicatæ, lobo obovato-lanceolato, lobulo parvo lineari; bracteola elongato-cuneata bifida.

Perianthia alte emersa, f. caulinis dimidio longiora, anguste clavato-pyriformia, sæpe subfusiformia, i.e. apicem versus in rostellum brevem sensim attenuata, tota facie supra medium, ad carinas præcipue, crebre acute muriculata.

Androecia subcylindrica tenuia; bracteæ 3–6-jugæ; antheridia solitaria binave (altero minore).

Pulchra species, *L. subspatulatæ* S. affinis, valde distincta tamen, præcipue perianthiis ex involucro parvo alte emersis, foliisque asperrimis.—A *L. tenuistipula* L. et G. certe distare videtur foliis facie fere tota echinatis, cellulis submajoribus; foliolis præminutis; perianthiis angustioribus valde exasperatis. *L. semiscabrida* G. in Hep. N.-Granat. 60, habet folia subapiculata, solum dimidio supero echinata; foliola obcuneata extus utrinque unidentata.

14. HARPA-LEJEUNEA DIVERSICUSPIS, Spruce.

Hab. Ad fluvii *Negro* cataractas, in cortice, cum aliis *Lejeuneis* intricata.

F ·3 × ·3, ·3 × ·25, *lob* ·08–·12, *c* $\frac{1}{50}$–$\frac{1}{40}$; *foliola* ·07—·08; *br* 3; *br*^{la} ·25 × ·125; *per* ·45 × ·25, ·55 × ·33^{mm}.

Minuta pallida, siccando fuscidula, dense cæspitoso-repens. Caules $\frac{1}{8}$–$\frac{1}{4}$ pollicis longi tenues fragiles subramosi, ramis inæquilongis.

Folia parum imbricata valde obliqua, a plica basali suberectâ divergentia, late ovata obtusa vel abrupte acuta, raro leviter acuminulata, interdum rotundata, repanda, superne celluloso-crenulata integerrimave, pulchre pellucido-reticulata, infra medium profundissime sinuato-complicata; lobulus folio 2–4-plo brevior subhemisphæricus, margine transverso involuto; cellulæ pellucidæ parvæ subpachydermes, marginales minores subquadratæ subopacæ.

Foliola distantia, foliis 4-plo minora, subrotunda, ad medium bifida, segmentis acutis.

Flores monoici; ♀ in ramo primum brevi, demum innovando-elongato, terminales. Bracteæ foliis æquilongæ ad $\frac{2}{3}$ bilobæ, lobo oblique ovali acuto, lobulo oblongo linearive; bracteola angusta cuneato-lanceolata ad $\frac{1}{2}$ acute bifida, segmentis erectis acutis.

Perianthia foliis majora emersa pyriformia compressula 5-carinata, carinis papillosis interdum rudimentarie alatis.

Androecia cauligena, folium collaterale subexcedentia; bracteæ 3–4-jugæ turgidæ, foliis duplo breviores.

Folia, nisi pro lobulo turgidissimo, sæpe fere plana, alia apice hamata, caulina fere semper lobulata, ramulina lobulo nunc ad pliculam planam redacto, nunc magno folio vix duplo minore.

A *L. paratropa* S. certe distincta est minutie; foliis plus minus obtusis —nunquam distincte acuminatis; perianthiis brevioribus (haud clavatis), carinis superne scabridis sed non spinulosis; præcipue autem foliolorum segmentis acutis.

15. HARPA-LEJEUNEA PARATROPA, Spruce.

Hab. In M. *Campana* Andium Peruvianorum, cum *L. galeata* aliisque *Lejeuneis*, in cortice.

F ·4 × ·35, *lob* ·125–·15, *c* $\frac{1}{4\,5}$; *f*^{la} ·1 × ·075; *br* ·3; *br*^{la} ·25 × ·08; *per* ·6 × ·25^{mm}.

Pusilla olivaceo-viridis, post siccationem valde flaccida. Caules prostrati intricati, $\frac{1}{2}$–1-poll. longi, tenues flexuosi, vage pinnatimve ramosi.

Folia contigua dissitave, a basi semierecta divergentia, late oblique ovata abrupte acuminata acuta, obscure celluloso-crenulata valde

sinuato-complicata; lobulus subtriplo brevior saccato-decurrens subovatus convolutus, apice occulto; cellulæ subparvæ pellucidæ, inferiores sensim majores.

Foliola foliis 4-plo minora cuneato-obovata vix ad medium usque bifida, segmentis obtusis patulis.

Flores monoici; ♀ in ramo brevissimo terminales, innovatione simplice suffulti. Bracteæ foliis minores, oblique obovato-lanceolatæ acutæ, ad medium bifidæ, lobulo angusto lineari; bracteola foliolis duplo major, cuneato-ligulata vix ad medium bifida, segmentis subobtusis.

Perianthia alte emersa, foliis caulinis dimidio longiora, clavata, brevirostria compressula anguste 5-carinata, carinis papuloso-scaberulis, aliquando (nec constanter) apice pauci-spinulosis.

Androœcia ramulo brevi cauligeno, folio subæquilongo, constantia, ovato-oblonga; bracteæ parvulæ sub 4-jugæ.

A *L. galeata*, S.—sæpe in eodem cæspite vigente—distincta florescentia monoica; foliis acute subacuminatis subcrenulatis, et perianthiis apice scabris spinulosisve.

16. HARPA-LEJEUNEA SPINULIFLORA, Spruce.

In fluvii *Casiquiari* ripis, supra *Lejeuneas* (*L. Sagræanam* aliasque) in cortice repens.

F ·35 × ·25, ·2 × ·15, *c* $\frac{1}{45}$; *f*^{la} ·05; *br*^{la} ·3 × ·1; *per* ·5 × ·25^{mm}.

Pusilla pallide fuscidula. Caules $\frac{1}{4}$-pollicares filiformes parce et subpinnatim ramosi, aliis ramis elongatis.

Folia longe distantia, angulo 70° patentia, subplana, oblique oblonga obovatave plerumque rotundata, basi obsoletissime complicata; cellulæ parvulæ pellucidæ subconformes.

Foliola minutissima, foliis 6–7-plo breviora, latitudine caulem haud excedentia, oblonga, ad $\frac{1}{2}$ bifida, segmentis late subulatis (3 cellulas longis basique latis).

Flores dioici (*l*)—♀ in ramo brevi terminales, innovatione suffulti. Bracteæ foliis subæquales, oblique obovato-lanceolatæ vix ad medium bifidæ, parvilobulatæ; bracteola oblongo-ligulata breviter bifida, sinu segmentisque acutis.

Perianthia bracteis dimidio longiora, pyriformia rotundata subretusave rostellata, antice 1-carinulata, postice 2-carinata, margine carinisque spinoso-cristata, spinis hamatis 3–4 cellulas longis, basi 1-2 cell. latis, valde decidius.

Androœcia haud visa.

Obs. Inter congeneres paulo aberrans est, e foliis planis rotundatis; perianthiis spinosis autem *Harpa-L. blepharogonæ* aliisque plane accedit.

17. HARPA-LEJEUNEA ACANTHOGONA, Spruce.

Hab. In M. *Tunguragua*, supra truncos putrescentes.

F ·6 × ·35; *lob* ·1; *c. mediæ* $\frac{1}{40}$–$\frac{1}{30}$; *f*^{la} ·08; *br* ·3; *br*^{la} ·3 × ·15; *per* ·75 × ·35 (*spinis inclusis*)^{mm}.

Pusilla, olivaceo-viridis, prostrata, intricata. Caules 2–3^{cm} longi flexuosi laxe cellulosi, tenaces tamen, laxe pinnati, pinnis subsimplicibus.

Folia subcontigua, e basi brevi saccatâ semierectâ subdivergentia, decurvo-concava, alia planiuscula, late oblique semicordato-ovata subtri-

angularia, abrupte acuta obtusave raro obtusata, ad lobuli junctionem subsinuata; lobulus 6-plo brevior saccatus, margine sinuato-incurvo subtransverso, haud raro subobsoletus; cellulæ mediæ mediocres, inferiores sensim majores, submarginales multo minores, omnes subæquilateræ subincrassatæ parum chlorophyllosæ fere planissimæ. F. ramea duplo fere minora.

Foliola minuta, foliis 7-plo minora, orbiculata, ad medium bifida, sinu segmentisque subacutis.

Flores monoici: ♀ in ramo brevissimo terminales, innovatione brevi longioreve suffulti. Bracteæ parvæ, foliis 2-plo minores, appressæ, bilobæ vix complicatæ, lobo oblique ovali acuto, vix ad medium usque cum lobulo lineari-lanceolato connato; bracteola libera anguste oblonga, vix ad $\frac{1}{2}$ usque acute bifida.

Perianthia alte emersa, foliis caulinis longiora, cylindrico-oblonga superne parum latiora, compressula, supra medium 5-carinata, *carinis spinoso-cristatis-alatisve*, apice brevi-rostellata.

Amenta ♂ cauligena, f. caulino subæquilonga, tenuia; bracteæ 5–6-jugæ minutulæ.

L. paratropa, S. (e M. *Campana*), subsimilis, folia habet multo minora valde sinuato-complicata acuminata, lobulo pro ratione duplo majore; foliola majora cuneato-obovata haud ad $\frac{1}{2}$ bifida, segmentis obtusis; denique perianthia clavata, carinis solum scaberulis v. (rarissime) paucispinis.

L. diversicuspis (e fl. *Negro*), foliola fere eadem ac L. *acanthogonæ* habet; folia tamen duplo minora, ad lobuli apicem profundissime sinuata, lobulo majore fere hemisphærico; bracteas foliis æquimagnas; perianthia pyriformia ad carinas solum submuricata.

18. HARPA-LEJEUNEA BLEPHAROGONA, Spruce.

Hab. In monte *Azuay*, alt. 3000^{m}, in arborum ramulis, supra *Tayloriam luciniatam* S. repens.

F ·5 × ·4, *lob* ·15; *c* $\frac{1}{5}$–$\frac{1}{10}$; *f*^{la} ·18 × ·15; *br* 4; *br*^{la} ·4 × ·2; *per* ·75 × ·4^{mm} (*sine ciliis*); *cilia* ·15^{mm} *vel* 8 c. *longa*.

Pusilla virescens; caules $\frac{1}{4}$–$\frac{1}{2}$ pollicares, inæqualiter subpinnatim ramosi.

Folia dissita, superiora autem ramulinaque subimbricata patula decurvulo-concava, late oblique semicordato-ovata rotundata, sinuato-complicata; lobulus rhombeus apiculato-acutus, inflatus et e marginis inflexione ovoideus; cellulæ parvæ vix incrassatæ subopacæ, subplanæ, inferiores sensim majores.

Foliola foliis 3-plo minora ovato-orbiculata ad v. paulo ultra $\frac{1}{2}$ bifida, sinu obtuso, segmentis falcato-lanceolatis subobtusis.

Flores monoici: ♀ in ramulo perbrevi, foliis 0–1-jugis stipato, innovatione simplice tamen aucto, terminales. Bracteæ foliis subminores laxe complicato-bilobæ, subdenticulatæ, lobo obovato-rotundo, lobulo duplo minore subquadrato; bracteola cuneato-lanceolata, ad $\frac{1}{3}$ bifida, segmentis subacuminatis acutis.

Perianthia majuscula emersa obovata, subpellucida, ex apice retuso brevirostellata, prælte 5-carinata, carinis ciliato-spinosis, ciliis ad 8 c. longis, inferne 2 c. latis.

Amenta ♂ lateralia, folio caulino breviora; bracteæ sub 3-jugæ.

L. acanthogona (*e Tunguragua*) differt statura majore; foliis sub-

majoribus pro more subacutis, lobulo minore; foliolis minutis (plus duplo minoribus); bracteis subintegerrimis, angustioribus, lobulo lineari-lanceolato; demum perianthiis angustioribus subcylindricis, solum supra medium carinatis, carinis ala in spinas latiusculas incisa auctis.

19. STREPSI-LEJEUNEA INFLEXA, Hampe.

in Lehm. Pug. vii., p. 22. Syn. Hep. 350.

Hab. In fl. *Negro* sylvis, ad fructicum ramulos, necnon ad arborum radices irrigatas, rarius in cortice vetusto. Etiam in Surinamo et Antillis.

F. 55 × ·4; *lob* ·1–·15; *c* $\frac{1}{50}$–$\frac{1}{55}$; *f*^{la} ·25–·3; *br* ·55; *br*^{la} ·5 × ·5, ·5 × ·45; *per* ·8 × ·5^{mm}.

Majuscula mediocrisve, e pallide viridi flavescens, late effusa denseque subcæspitosa. Caules pollicares pinnati bipinnatique, ramis assurgentibus inæquilongis aliis polyphyllis.

Folia ad lat. $\frac{1}{3}$ v. ultra imbricata, subdivergentia, semicordato-ovata, apice decurvo tortili acutata acuminatave, papulosa, margine celluloso-repanda angulataque, superiora interdum apice grosse subdenticulata, margine postico subrecto solum ad lobuli apicem sinuato; lobulus folio 4–5-plo brevior rhomboideus triangularisve subacutus inflatus, margine parum incurvo; cellulæ parvæ guttulatæ pellucidæ alte convexo-prominulæ, pariete incrassato, trigonis conspicuis, intus 6-sinuatæ ambituque anguste opacæ.

Foliola contigua aut subimbricata, foliis subduplo breviora, basi brevi inserta (unde facile soluta), orbiculata, angulata, ad $\frac{1}{3}$–$\frac{1}{2}$ bifida, sinu valde obtuso depresso, segmentis subacutis incurvis, raro radicellifera.

Flores monoici; ♀ in ramis longiusculis—interdum in ipso caule—terminales, innovatione simplice, rarius iterum innovando-prolifera, suffulti. Bracteæ foliis subæquales, paulo augustiores, subincurvæ, acuminatæ, grosse repandæ v, subdenticulatæ, ultra $\frac{3}{4}$ bilobæ, parum complicatæ, lobulo angusto apice lineari obtuso; bracteola majuscula orbiculata v. late elliptica incurva, apice ad $\frac{1}{3}$ solum obtuse bifida, segmentis acuminulatis conniventibus.

Perianthia majuscula foliis dimidio longiora pyriformia compressula rostellata acute 5-carinata, carinis rudimentarie alatis undulatis repandulisque sublævibus.

Andrœcia magna crebra, rami apicem vel totum fere tenentia; bracteæ pluri- (ad 15-) jugæ, majusculæ, foliis paulo minores, ad $\frac{1}{2}$ fissæ, fere æquilobæ, turgidæ papulosæ erosulæ. Ramum ♂ vidi supra andrœcium denuo ramosum, aliis ramulis masculis, aliis normaliter foliosis.

20. STREPSI-LEJEUNEA GABRIELENSIS, Spruce.

Hab. S. Gabriel, fluvii *Negro*, in cortice.

L. inflexæ similis et forsan ejusdem varietas; differt autem statura subminore; foliorum cellulis minoribus ($\frac{1}{60}$–$\frac{1}{70}$^{mm}) opacis; foliolis subminoribus fere planis, segmentis obtusatis; bracteola angustiore ad $\frac{1}{4}$ acute bifida; perianthio minore fere turbinato subobtuse 5-carinato; amentis ♂ multo brevioribus folio caulino paulo longioribus, bracteis solum 3–5-jugis laxiusculis; (bracteola ♀ ·38 × ·28^{mm}).

SUBGENUS XXI.—*TRACHY-LEJEUNEA*, S.

Plantæ robustiusculæ, raro pusillæ, albicantes, siccando sæpe fuscescentes, pro more dense stratificatæ, in vivo semper aqua repletæ, post siccationem haud facile emolliendæ.

Caules prostrati pinnati bipinnative, valde tenaces, interdum purpurei sanguineive; rami inæquilongi, sæpe assurgentes dein apice attenuato decurvi.

Folia imbricata, plerumque pellucida, decurvo-fornicata longiora quam lata, sæpius subacuta obtusave, rarius rotundata v. subacuminata, nonnunq. in eadem stirpe varia, margine e cellulis prominulis crenulata serrulatave, in unica sp. apice spinosa, facie raro sublævia, plerumque asperula, in paucis muricato-asperrima, basin versus recte vel sinuato-complicata; lobulus sub 4-plo brevior, raro subobsoletus; cellulæ in plurimis mediocres ($\frac{1}{24}$–$\frac{1}{35}$ mm diam.), in paucis parvæ—subbasales sæpe duplo majores ocellum sistentes—pro more obtuse, rarius acute, in *T. L. papillata* subulato-prominulæ, pariete plus minus incrassato, chlorophyllo haud copioso.

Foliola subrotunda in pluribus parva minutave, foliis 3–7-plo minora, in paucis $\frac{1}{2}$ folium subæquantia, integerrima vel rarius spinulosa—in unica foliis imo majora spinosaque—in omnibus lævissima, ad $\frac{1}{3}$–$\frac{1}{2}$ (raro ultra) bifida, segmentis acutis. Radicellæ patentes validæ apice nodoso-ramosæ.

Flores in omnibus—*T. L. acanthina* excepta—monoici. Fl. ♀ ramo brevissimo constantes, innovatione in plurimis nulla, in perpaucis brevi simplice suffulti. Bracteæ foliis longiores, angustæ, lobulatæ, sæpe falcatæ hamatæque, plerumque muricato-serrulatæ denticulatæque—raro spinulosæ; bracteola libera lineari-cuneata v. ovalis—raro orbiculata—rima augusta ad $\frac{1}{5}$–$\frac{1}{4}$ (raro ultra) bifida, interdum integra, sæpe denticulata, in *L. acanthina* argute subduplo-spinosa.

Perianthia (nonnunq.-rufula v. etiam sanguinea) sæpe angusta, clavato-pyriformia rotundato-truncata rostellata, plus minus compressa 5-carinata, carinis tenuibus tuberculosis papillosis v. muriculatis, interdum subalatis, in paucis sp. tota facie exasperata; in *T. L. acanthina* autem fere rotunda sublævissima.

Amenta ♂ ramulum brevem cauligenum, rarius rami longioris apicem solum tenentia; bracteæ 3–6 jugæ parvæ diandræ.

Cheilo-Lejeunea differt præcipue cellulis chlorophyllosis subopacis, minus et nunquam acute prominulis; foliis semper rotundatis; bracteis integerrimis; perianthiis compressis incurvis, demum bilabiatis, carina antica subnulla, posticis sæpe humillimis, nunquam exasperatis.

Harpa-Lejeunea distincta est minutie, caule breviore tenuiore minus pinnato, ramis ♀ constanter innovatis; foliis persæpe acuminatis, lobulo majusculo, cellulis duplo minoribus; bracteis rarissime denticulatis; perianthiis interdum ad carinas spinoso-alatis.

Hab. In truncis prostratis putrescentibus, in saxis vel in ipsa terra quartzosa, raro in cortice vivo vel in filicibus; in planitierum sylvis humidis vulgatæ, in montibus rarissimæ.

Distr. In sylva Amazonica, ad fl. Negro, Uaupés et Casiquiari præcipue, valde frequentes conspicuæque, paucis speciebus autem constantes; unica species in Andibus Peruvianis, alt. circiter 1000^{m} viget. Ipse 6 species legi, omnes (ut videtur) novas. Cæteræ species eidem subgeneri refer-

endæ perpaucæ videntur, nisi e descriptionibus difficillime recognoscendæ; 2 in 'Syn. Hep.' definitas haud sine dubio citare ausim, sc. *L. oblongifolia* L. et G., in cortice Cinchonæ lecta, et *L. oculata* G. ex insula *Hawaii*. *L. papillata* Mitt. autem, species Novo-Zelandica pulcherrima, certe huc referenda, nostræ *T. L. acanthinæ* peraffinis.

A. *Ramus* ♀ *simplex.*

a. *Foliola maxima, foliis imo majora, spinosa.*

1. *T. L. acanthina.* Dioica. F. arcte imbricata ovalia acuminulata, facie insigniter tuberculosa, margine celluloso-erosa apiceque paucispina. Foliola cordato-orbiculata ultra ⅓ biloba. Bracteola foliolis subconformis subduplo spinosa. Per. fere orbicularis subacuta valde compressa alte 5-carinata fere lævissima.

b. *Foliola dimidium folium subexcedentia.*

2. *T. L. asperiflora.* Robusta sæpe cæspitosa. F. parum imbricata falcato-divergentia semioblonga, apice decurvo rotundata v. subacuta, papulosa, lobulo sub 4-plo breviore. Foliola subcordato-rotunda ad vel ultra ½ bifida. Br. foliis longiores parum complicatæ inæquilobæ; bracteola ovalis ad ¼ anguste bifida, segmentis acuminulatis. Per. emersa clavato-pyriformia 5-gona, tota facie cellulis prominulis exasperata.

c. *Foliola foliis 2–5-plo minora.*

[*T. L. papillata.* F. subcontigua semiovato-lanceolata subobtusa margine facieque cellulis subulato-prominulis asperrima, lobulo plus duplo breviore lævi. Foliola ½ folio subminora ovalia ad ½ bifida subspinulosa tenuissima lævissima. Bracteola ovali-lanceolata breviter biloba spinulosa. Per. alte emersa pyriformi-oblonga, basi excepta, tota facie setulosa, alte 5-carinata.—*N. Zelandia.*]

3. *T. L. pellucidissima.* F. late semiovata rotundata, interdum subacuta, erosula serrulatave, basi ocellata, lobulo 4-plo breviore. Foliola 3–4-plo breviora ovalia ultra ½ bifida utrinque sæpe 1-dentata. Br. oblongæ muricato-serrulatæ anguste lobulatæ; bracteola oblonga apice bidentula. Per. subemersa pyriformi-oblonga subcompressa 5-carinata, carinis scaberulis interdum peranguste alatis.

4. *T. L. pandurantha.* Caules validi rufi pinnati, ramis arcuatis. F. semiovato-oblonga sæpius obtusata ocellata eroso-denticulata facie lævinscula, lobulo 5-plo breviore. Foliola lobulis æquilonga subrotundata vix ad ½ bifida. Br. denticulatæ, lobulo duplo breviore; bracteola ovalis obtusa integra v. bidentata. Per. vix emersa pyriformia compressula, ante apicem latum constricta, alte 5-carinata, carinis alatis denticulatis.

B. *Ramus* ♀ *innovatione auctus.*

5. *T. L. Aquarius.* Priori similis, arctius pinnata, ramis sæpe parvifoliis, fœmineis innovatis. F. acutiora—ramea subacuminata—apice serrulata, facie muricato-aspera. Per. magna alte emersa clavato-pyriformia, inferne teretia, superne compressa alteque 5-carinata, carinis subalatis, tota facie aspera.

6. *T. L. immersa.* F. ovata subacuta angulata crenulataque, lobulo 0. Foliola ½ folium vix æquantia orbiculata ad ½ bifida. Br. foliis multo longiores lanceolatæ crenulatæ denticulatæque minute lobu-

latæ; bracteola oblonga subacuta integra minute denticulata. Per. immersa pyriformi-oblonga supra medium 5-carinata, carinis papillosis.

1. TRACHY-LEJEUNEA ACANTHINA, Spruce. (TAB. VI.)

Hab. In Andium Peruvianorum montibus humilioribus circa oppidum *Tarapoto*, alt. 800–1000^{m}., supra saxa et truncos prostratos.

F ·6 × ·35, *lob* ·15 ; *c* $\frac{1}{4}^{\frac{1}{5}}$; f^{la} ·5 × ·5 ; *br* ·9 ; br^{la} ·65 × ·7 ; *per* ·55 × ·55^{mm}.

Plantæ procumbentes, dense implexo-cæspitosæ, albicantes, in sicco interdum fuscescentes. Caules $\frac{1}{2}$–$\frac{3}{4}$-pollicares flexuosi inæqualiter subpinnati, basi sola radicelliferi, ramis assurgentibus arcuatis.

Folia opaca, dense imbricata, late patula fere divergentia, apice fornicato-decurva, oblique ovalia oblongave acuminulata, apice inæqualiter dentato-spinosa, v. inciso-2–3-dentata, dentibus cuspidatis, basin versus sinuato-complicata, facie tuberculoso-aspera, margine toto celluloso-erosa; lobulus 4-plo brevior ovatus inflatus, apice excisoacutus; cellulæ parvulæ subopacæ parum elongatæ, insigniter papuloso-prominulæ, ad angulos valde incrassatæ, trigonis maximis, chlorophyllo parco cum cystis oleiferis curvulis anguste ovalibus raro subrotundis—in sicco interdum absorptis dispersisve—mixto.

Foliola imbricata foliis parum breviora, latiora tamen superficieque foliis etiam majora, cordato-orbiculata, ultra $\frac{1}{3}$ biloba, lobis acutatis; margine toto externo dentato-spinosa, spinis utrinque sub 5, integerrimis vel sæpe denticulatis.

Flores dioici: ♀ in ramo brevi longioreve terminales, innovatione nulla suffulti. Bracteæ foliis dimidio longiores ad $\frac{1}{2}$ complicato-bilobæ, falcato-decurvæ, lobo oblique ligulato-oblongo acuminato apice spinuloso, lobulo parvo subulato spinuloso; bracteola foliolis paulo major, conformis, fere ad $\frac{1}{2}$ biloba, lobis tenui-acuminulatis, subduplo inciso-spinosa-ciliatave.

Perianthia bracteolâ paulo minora, fere orbiculata, utroque fine subacuta, apice brevi-rostellata, basi paulo magis angustata, valde compressa, alte tamen 5-plicato-carinata, carinis fere lævissimis solum e cellula hic illic prominula repandulis.

Amenta ♂ ramulum, folio caulino duplo longiorem, v. totum v. ejus apicem solum tenentia, ovoidea; bracteæ 2–4-jugæ, equitantes, cymbiformi-complicatæ, fere ad $\frac{1}{2}$ bilobæ, lobis dimidiato-ovatis, antico sensim acuminato serrulato, postico $\frac{1}{3}$ breviore triangulari-apiculato, antheridia bina in gremio foventes.

Obs. Notabilis est *Trachy-Lejeunea acanthina* ob perianthia fere lævissima inermiaque foliis asperrimis spinosis nupta. Foliolis maximis spinosis differt a cæteris omnibus *Trachy-Lejeuneis*. Omnium specierum nostræ proxima, quanquam abunde distincta, est *L. papillata* Mitt. in Hook. f. Handb. Fl. N. Zealand, p. 533, cujus descriptionem videas ad pedem.*

* *Lejeunea papillata* Mitt. l. c. (N. Zealand, ad filicum frondes: SINCLAIR! in hb. Hook.)—Pusilla tenella, *L. ovata* Tayl. paulo major. Caules semipollicares vage ramosi, ramis pro more brevibus. Folia subcontigua dimidiato-ovato-lanceolata falcata obtusa vel abrupte subacuta, margine facieque externa tota fere insigniter *setoso-papillosa*, sinuato-complicata; lobulus lobo plus duplo brevior ovali-fusiformis lævissimus; cellulæ parvulæ extus *subulato-prominulæ*, paucæ subbasales laxiores subplanæ, *lobuli autem minores planissimæ*. Foliola $\frac{1}{2}$ folium vix æquantia, ovalia ad medium bifida, segmentis acutis, margine

Primo visu inter *Priono-Lejeuneas* collocanda, sed perianthia postice distincte acuteque bicarinata vetant.—*Priono-L. mucronata* Lacoste. (in Venezuela lecta) nostræ ob folia muriculata subaffinis; foliis abrupte tenui-apiculatis, foliolis ovatis profunde bifidis solum denticulatis, et (præ aliis) perianthiis obcordatis postice 1-carinatis margine *ciliatis*, differt.—*Priono-L. denticulata* Sw., ob ramulos ♀ haud innovatos, folia subacuminata denticulata facie asperula paulo accedit; statura tamen humili, foliolis integerrimis, et perianthiis obcordatis compresso-subplanis margine serrato-alatis, longius distat.—*Odonto-L. Peruviana* Lindenb. foliola habet sæpe magna bifida serrataque, fere ac in nostra, structura tamen cellularum, ramo ♀ prolifero, forma perianthii, etc. recedit.

Lophocolea fulvella Tayl. (sub Chiloscypho) e Cap. Horn, et *L. Gayana* Mont. (sub Chiloscypho) e Chili, quoad habitum, folia foliolaque dentata, cum nostra *Lejeunea* singulari modo congruunt, generice tametsi longe distant.

2. TRACHY-LEJEUNEA ASPERIFLORA, Spruce. (TAB. VII.)

Hab. In sylvis humilioribus fluvii *Negro* prope *S. Carlos*, et fl. *Uaupes* juxta *Panuré*, in terra arenosa inter filices (*Schizæas* aliasque) quarum stipitibus irrepit.

F ·6 × ·5, *lob* ·15 × ·125, *c* $\frac{1}{44}$—$\frac{1}{35}$; *f*^{la} ·35 × ·4; *br. lob. aut* ·65 × ·3; *br*^{la} ·55 × ·35; *per* ·8 × ·35; 1·0 × ·4^{mm}.

Pallida, sat robusta, prostrata vel haud raro cæspitoso-erecta. Caules 1–2-pollicares flexuosi parum ramosi, sæpe ramulis ♀ pinnulati, radicellis suis flabellatis arcte repentes vel inter se adhærentes.

Folia subimbricata falcato-subdivergentia, apice decurvo hamata, semicordato-ovato-oblonga rotundata, rarius abrupte obtusa vel subacuta, margine eroso-repanda, basin versus recte vel subsinuato-complicata; lobulus 4-plo brevior ovato-rhombeus inflatus, apice acuto incurvo; cellulæ parvulæ prominulæ valde pellucidæ, ambitu anguste opacæ, sinuoso-hexagonæ, pariete ad angulos insigniter incrassato.

Foliola foliis vix duplo breviora, contigua vel subdissita, subcordato-rotunda, paulo latiora quam longa, ad medium—raro ultra—bifida, sinu triangulari, segmentis acutis, carinata, sæpe squarroso-patentia, margine repandulo.

Flores monoici: ♀ in ramo brevissimo, basi foliis parvis solum unijugis stipato, terminales. Bracteæ foliis sublongiores valde falcatæ involutæque ad ½ bifidæ (nec semper complicatæ), lobo ligulato-oblongo obtusato, lobulo duplo breviore anguste lanceolato acuto; bracteola ovalis ad ¼ bifida, segmentis acuminulatis contiguis forticatisve.

Perianthia majuscula, basi a bracteis demum subremota, clavata abrupte subacuta—rarius rotundata—obscure rostellata, subcompressa, 5-gona, tota facie (ad angulos præcipue) cellulis alte prominulis exasperata, demum apice 2–5-valvia. Calyptra dimidio brevior pyriformis apice demum bivalvis.

Androecia ramulo cauligeno sistentia, vel in ramo longiore—raro in ipso

eroso-spinulosa, cæterum lævissima, tenuissima fere vitrea. Flores monoici: ♀ in ramo brevissimo terminales, innovatione nulla. Bracteæ foliis minores oblique ovales inæquilobæ; bracteola ovali-lanceolata apice breviter biloba: omnes spinulosæ. Perianthia alte emersa pyriformi-oblonga, basi conicâ lævi exceptâ setulosa, alte 5-carinata, carinis compressis apice rotundato-truncatis. Amenta ♂ ramum brevem terminantia; bracteæ paucijugæ majusculæ turgidæ sublæves.

caule—terminalia, longispica; bracteæ 5–12-jugæ majusculæ turgidæ diandræ laxe imbricatæ.

Species insignis distinctissima, nisi pro perianthiis subæqualiter 5-gonis scabris inter *Cheilo-Lejeuneas* militaverit.

3. TRACHY-LEJEUNEA PELLUCIDISSIMA, Spruce.

Hab. In cortice vetusto semiputrido juxta *S. Carlos* del *Rio Negro*, præcipue secus rivulum *Cauapuna* frequens; etiam ad *Marabitanas*, et in fl. *Caipurú* (fl. *Trombetas* tributarii) ripis.

F ·6 × ·5, *lob* ·15–·2, *c* $\frac{1}{35}$—$\frac{1}{30}$; f^{la} ·15 × ·125, ·2 × ·15; *br* ·75; br^{la} ·6 × ·35; *per* ·8 × ·5^{mm}.

Albescens tenera valde pellucida laxe depresso-cæspitosa. Caules in matrice arcte repentes, sæpe subparalleli, inferne subpinnati, apice longe simplices, aliis ramis assurgentibus apiceque decurvo radicantibus.

Folia subimbricata decurvo-patula late semiovata rotundata, obtusa, vel abrupte subacuta, facie tuberculosa muriculatave, margine postico recto vel concavo integerrima, antico rotundato apiceque minute muricato-denticulata, basi subdecurrente complicata; lobulus 3–4-plo brevior ovato-fusiformis inflatus, apice brevi involuto; cellulæ mediocres valde pellucidæ fere vacuæ, granis chlorophylli perpaucis sparsis, raro in annulum incompletum angustum congestis, pariete ad angulos vix minute incrassato, conico-prominulæ obtusæ—marginales autem multo minores et acutæ, basales 6–8, cellulis mediis duplo longiores, in ocellum aggregatæ.

Foliola dissita, foliis 3–4-plo breviora, ovalia rhombeave, ultra dimidium acute bifida, segmentis angustiusculis subacuminatis, margine suberoso, medio utrinque sæpius obtuse unidentata.

Flores monoici: ♀ in ramo brevissimo, basi foliis parvis unijugis (raro pluribus) stipato, terminales. Bracteæ foliis longiores, falcatæ, ad ½ complicato-bilobæ, lobo oblique semiovali subacuto muricato-serrulato, plica triplo angustiore lineari-rhomboidea, apice libero (*i.e.* lobulo) lanceolato; bracteola oblonga brevissime bifida, interdum integra.

Perianthia foliis longiora pyriformi-oblonga vel subclavata, compressula, apice rotundato-truncato obsolete rostellata, antice 1–carinata, postice alte 2-carinata, carinis muricato-asperis, interdum supra medium anguste alatis.

Amenta ♂ crebra, elongata, ramulum totum vel ejus apicem solum sistentia; bracteæ 4–10-jugæ majusculæ turgidæ.

Ramus fertilis rarissime parum elongatus invenitur, ramulumque minutum, foliis 2–3-jugis vestitum—interdum masculum—profert. Ramulus autem iste pro innovatione nullomodo habendus, quam ab involucro foliis 1–2-jugis dissitus est.

9. TRACHY-LEJEUNEA PANDURANTHA, Spruce.

Hab. In fl. *Negro*, *Uaupés*, etc. sylvis, supra truncos putridos, frequens.

F ·75 × ·55, *lob* ·15; *c* $\frac{1}{3\cdot2}$; f^{la} ·15 × ·15; *br* 1·0 × ·7; br^{la} ·75 × ·5; *per* ·85 × 55, ·85 × ·75^{mm}.

Robusta, flavida, prostrata, late denseque stratificata, semper aqua repleta.

Caules 2-pollicares, intricati, flexuosi, rufi purpureive, validi, tenaces, strato corticali e cellulis 7-seriatis magnis oblongo-quadratis pellucidis, stratis 2 v. 3 interioribus e cellulis multo angustioribus, conflati, inæqualiter pinnati, ramis arcuato-flexuosis sæpe apice attenuatis.

Folia rigidiuscula, paulo (vix ad $\frac{1}{4}$ lat.) imbricata semiovata-oblonga subfalcata, apice decurvo v. fere involuto rotundata obtusatave—ramorum interdum subacuta, facie sublævissima, margine fere toto minute eroso-denticulata, basi antica dilatata sed non semicordata, postica subrecte complicata, plicâ fere rectâ v. parum convexâ, sensim in folium abiens; cellulæ mediocres pellucidæ, haud incrassatæ, subconformes, paucis (3–6) ad folii mediam basin cæteris duplo majoribus in ocellum congestis, subplanæ, solum marginales obtuse acuteve prominulæ.

Foliola minuta, caule haud latiora, foliis 5-plo breviora, subrotunda, vix ad $\frac{1}{2}$ usque anguste bifida, segmentis acutis integerrimis.

Flores monoici: ♀ in ramo brevissimo, foliis sub 2-paribus (infimis minutis) vestito, terminales, innovatione nulla suffulti. Bracteæ foliis majores, falcatæ, incurvo-concavæ, eroso-denticulatæ, lobo valde oblique ovali obtuso, lobulo 4-plo angustiore sub 2-plo breviore acuto acuminulatove; bracteola brevior ovalis obtusa, apice vel integra vel sæpius brevissime anguste bifida.

Perianthia vix emersa, f. caulinis tamen sublongiora—demum elongata—rufa sanguineave, pyriformia compressula paulo infra apicem latum rotundato-truncatum subconstricta, adeo panduriformia, alte 5-carinata, carinis alâ 4–5-cellulas latâ, apice muricato-denticulatâ, tota fere longitudine auctis, marginalibus valde devexis.

Androecia cauligena, foliis sublongiora tenuia; bracteæ 4–6-jugæ parvæ vix contiguæ compresso-subglobosæ turgidæ apice subinæqualiter bilobæ.

Trachy-L. pellucidissima differt teneritate, pelluciditate, ramificatione sparsiore; foliis brevioribus fere planis, facie plus minus scabris; foliolis solum 3–4-plo (nec 5-plo) minoribus, ultra $\frac{1}{2}$ bifidis; perianthiis infra apicem haud constrictis, carinis peranguste (vel sæpe non) alatis. *Tr.-L. Aquarius* ramo fertili innovato et foliis asperrimis longius distat.

5. TRACHY-LEJEUNEA AQUARIUS, Spruce.

Hab. In sylvis præcipue humilioribus ad flumen *Negro* superius vulgata, ubi ad truncos semiputridos plagas magnas densas albidas, semper aqua repletas, efformat.

F ·55 × ·45, *lob* ·15; *c* $\frac{1}{50}$; f^{la} ·125–·15; *br* ·8–1·0; br^{la} ·45 × ·3; *per* 1·3 × ·35^{mm}.

Caules 3-pollicares procumbentes intricati rufescentes, validi tenacissimi, haud facile rupti, strato corticali e cellulis magnis pellucidis 7-seriatis, stratis internis 3 v. 4 e cellulis multoties angustioribus, conflati, arcte pinnati, ramis sæpe parvifoliis eleganter decurvis.

Folia confertiuscule imbricata, late dimidiato-ovata subfalcata, apice devoluta, caulina abrupte oblique subacuta, ramea acutata v. subacuminata, omnia e cellulis prominulis facie muriculata, margine denticulata apiceve serrulata, caulina recte, ramea sinuato-complicata, lobulo 4-plo breviore convoluto-inflato; cellulæ parvæ, (subapicales minutæ,) guttulatæ, extus conicæ, paucæ suprabasales magnæ elongatæ in ocellum coacervatæ, omnes parietibus subincrassatis.

Foliola minuta foliis sub 4-plo minora, subrotunda, ad medium bifida.

Flores monoici: ♀ in ramo brevissimo terminales, innovatione simplice parvifolia, sæpe arcuata, interdum apice mascula, suffulti. Bracteæ foliis fere duplo longiores, vix ad ½ bilobæ concavæ (haud complicatæ), valde decurvæ devolutæve acutæ, facie externa valde exasperatæ apice subdenticulatæ, lobo obovato-ovali, lobulo multo minore angustiore lanceolato linearive; bracteola duplo fere brevior obovato-lanceolata brevissime bifida, segmentis obtusis, denticulata.

Perianthia magna f. caulinis fere triplo longiora, rufa sanguineave clavato-pyriformia apice lato subtruncata, facie ab ipsa basi e cellulis magnis ($\frac{1}{20}$—$\frac{1}{16}$mm.) tuberculoso-aspera, inferne fere teretia, superne sat compressa alte 5-carinata, carinis tenuibus, vel alatis, vel non, asperulis.

Amenta ♂ sat robusta cauligena, folia caulina 2-plo superantia, alia in ramulo longiore terminalia; bracteæ 5–10-jugæ, cymbiformes, fere ad ½ bilobæ, lobis anguste ovatis subobtusis, inferiore paulo breviore angustioreque; antheridia bina.

6. TRACHY-LEJEUNEA IMMERSA, Spruce.

Hab. Yurimaguas, fluvii *Huallaga*, in cortice.

F ·6 × ·5, ·65 × ·52, *c* $\frac{1}{30}$—$\frac{1}{24}$; *f*^{la} ·25 × ·3; *br* 1·0 × ·4; *br*^{la} ·6 × ·4; *per* ·6 × ·3^{mm}.

Pallide viridis siccando fuscidula, prostrata, plagas circumscriptas efficiens; caules pollicares flaccidi sat ramosi, ramis implexis subassurgentibus.

Folia subimbricata oblique ovata abrupte subacuta raro subapiculata, angulata vel erosula, celluloso-crenulata, basi obsolete complicata (lobulo 0); cellulæ majusculæ pellucidæ subelongatæ.

Foliola dissita dimidio folio minora orbiculata, paulo latiora quam longa, ad medium bifida, sinu segmentisque acutis, integerrima, subconcava.

Fl. *monoici*: ♀ terminales, cum innovatione simplice; bracteæ foliis multo longiores, suberectæ, oblique lanceolatæ, contortæ, celluloso-crenulatæ et subdenticulatæ vel etiam subincisæ, prope basin complicatæ, plicâ minutâ lineari apice subulatâ; bracteola minor (folia caulina æquans) oblonga vel subrotunda abrupte acuta rotundatave *integra*, plus minus denticulata.

Perianthia inclusa pyriformi-oblonga subretusa rostellata vix compressula, supra medium 5-carinata, carinis papilloso-cristulatis.

Amenta ♂ cauligena, folio æquilonga breviorave; bracteæ mediocres 3–5-jugæ.

A *L. pellucidissima* differt ramis fœmineis innovatis, foliis elobulatis, cellulis submajoribus, foliolis fere duplo majoribus, bracteis magis denticulatis incisisve, bracteola denticulata, et perianthiis ad carinas insigniter papilloso- (muriculatove-) cristulatis.

SUBGENUS XXII.—*DREPANO-LEJEUNEA*, S.

Plantæ pusillæ minutæve, virescentes fulvæve, in aliis hepaticis (præcipue *Lejeuneis*) laxe reptantes, sæpe vix perceptibiles, raro in plagulas densiores intricatæ. Caules tenues sed tenaciusculi, laxe pinnatim vel sæpius vage ramosi.

Folia dissita, primum assurgentia dein apice valide decurvo-hamata, elongata, 2–4-plo longiora quam lata, pro more oblique lanceolata acuminata acuta—raro latiora ovataque—lobulo ovato-fusiformi turgido (raro obsoleto) aucta, margine (antico præcipue) spinulosa crenulatave, in paucis speciebus insigniter pectinatim laciniata, lævia papulosave; cellulæ parvæ vel fere minutæ subconformes—raro paucæ subbasales majores ocellum sistentes—pellucidæ, pariete vix incrassato.

Foliola minuta, in sp. Austro-Americanis a basi integrâ brevissimâ cuneatâ biparita, cruribus 3–5 cellulas longis late divergentibus (in unica *L. palmata* erectis); in *L. hamatifolia*, Europæa, solum bifida, basi integra altiore, cruribus brevioribus.

Flores dioici, in perpaucis monoici: ♀ in ramo brevi terminales, innovatione simplice suffulti—in unica *L. campanulata* in caule ramove iteratim innovando-florifero. Bracteæ foliis longiores sæpeque multo latiores bilobæ concavæ, vix complicatæ, lobis parum inæqualibus spinulosis; bracteola angusta sæpe subovalis spinulosa, ad $\frac{1}{3}$–$\frac{1}{2}$ bifida, segmentis acuminatis, pro more cum bracteis altiuscule connata.

Perianthia sæpius emersa 5-gono-obpyramidata, rostellata, carinis in perpaucis inermibus, in plurimis superne spinulosis apiceque in cornu breve subhorizontale pungens dilatatis.

Andrœcia longispica; bracteæ majusculæ contiguæ rotundo-naviculares subæquilobæ, ad carinam e cellulis exstantibus pulchre moniliato-papulosæ, *monandræ*.

Hab. Species Amazonicæ et Andinæ in foliis vivis, filicibus, et lichenibus repens, necon alias hepaticas infestans, nunquam in cortice; species unica Europæa autem in fruticum cortice et in rupibus crescit.

Distr. In America æquatoriali 8 species legi, quarum 6 Andium juga sylvatica, alt. 1000–3000^{m} habitant, 2 solum in planitie visæ, earumque 1 (*L. palmifolia* N.) in sylvis ilum. Amazonum borealibus, super truncos prostratos, ad arborem pedem, etc. viget, semper autem caulibus suis tenacibus implexo-ramosis, foliorumque laciniis uncinatis, alias *Lejeuneas*, *Bazzanias*, etc. arcte amplectens, imove denique exstirpans. Altera species amazonica est *L. capulata* Tayl.! (quam nullo modo a planta Taylori originali, in Oware Africæ lecta, distinguere possum): probabiliter inter "*L. hamatifoliæ* vars." 'Synopseos Hepat.' jam enumerata. *L. hamatifolia* Hook. *vera* autem, Europæ occidentalis, ins. Britannicarum præcipue, incola, nusquam in America mihi obvia fuit. *L. inchoata* Meissn., ex ins. Antillis, certe eidem subgeneri pertinere videtur; aliæ species sunt *L. Ternatensis* G., *tenuis* N., *tridactyla* G., *trematodes* N., *dactylophora* N., *muricata* G., insulis Malayanis et Oceanicis indigenæ, pleræque *L. palmifoliæ* arcte affines.

§ 1. *Folia margine antico pectinatim incisa.*

1. *Drepano-L. palmifolia.* Dioica: Per. urceolata 5-carinata, carinis apice rotundo-prominulis, tota facie cellulis prominulis papulosa, cæterum inermia.

§ 2. *F. solum spinuloso-denticulata* v. *subintegerrima.*

A. *Perianthia perfecte inermia.*

Drepano-L. anoplantha. Dioica. F. hamata semilanceolata acuminata

celluloso-crenulata, facie papulosa. Per. vix emersa turgide obovata brevirostria, ad carinas subpapulosa.

B. *Perianthii carinæ superne spinis, ciliis denticulisve armatæ, v. saltem apice in cornu subulatum porrectæ* (*i.e. unispinæ*).

a. *Flores monoici.*

3. *D.-L. longirostris.* F. hamata semilanceolata acuminata obtuse spinuloso-denticulata subpapulosa. Per. emersa, obovata sensim prælonge rostrata, alte 5-carinata, carinis apice dilatato subulato paucispinis, demum apice in valvulas 5 erectas fissa.

b. *Flores dioici.*

4. *D.-L. capulata.* Minuta. F. distantia hamata ovato-subulata apiculato-acuminata, margine antico spinulis paucis nullisve, postico medio spinâ maximâ deversâ armata, cellulis subplanis. Per. emersa obpyramidata recte truncata brevirostria, carinis 5 altis apice in cornu acuminatum ciliatum porrectis.
5. *D.-L. lichenicola.* F. iis pr. similia, magis spinuloso-denticulata. Per. subimmersa rotundo-obovata brevirostria 5-gona, angulis parum prominulis subdenticulatis apice in cornua brevi-triangularia dilatatis.
6. *D.-L. infundibulata.* F. fere plana semiovata triangulariave acuta muricato-subserrulata. Per. maxima clavata brevirostria—demum (ore hiante) infundibulata—supra medium 5-carinata, carinis in subulam latam peracutam subhorizontalem apice dilatatis, cæterum inermibus.
7. *D.-L. campanulata.* F. subplana hamatave anguste lanceolata acuminata subdenticulata, ad lobuli apicem subspinulosa. Per. vix emersa urceolata humiliter 5-carinata, carinis apice 2–3 spinis, demum (ore hiante recurvo 12–15-dentato) companulata.
8. *D.-L. planiuscula.* F. subplana ovato-lanceolata subacuminata spinuloso-denticulata. Per. subemersa urceolata, apice truncato clauso brevirostria, prælte 5-carinata, carinis superne in alam paucilaciniatam dilatatis.

[*D.-L. hamatifolia* ab omnibus prioribus differt foliolis solum bifidis (nec bipartitis), obtriangularibus, sinu apicis lato sublunulato, lobis brevisubulatis basi 3 c. (raro solum 2 c.) latis. F. iis *L. capulatæ* et *lichenicolæ* subsimilia, apice minus attenuata, spinâ posticâ carentia, margine antico rude 3–4 dentata. Per. prælonga pyriformia sensim brevirostria, acute 5-gona, carinis superne setoso-spinosove-alatis. —*Britannia*, &c.]

1. DREPANO-LEJEUNEA PALMIFOLIA, Nees.

In Mart. Fl. Bras. I. 1, 366. Syn. Hep. 347.

Hab. Ad flumen Amazonum fere totum, præcipueque secus ejus tributarios boreales, fl. *Negro*, *Uaupés*, *Casiquiari*, etc., in truncis decisis, ad arborum pedem in rupibus, etc., semper fere supra alias Hepaticas (*Bazzanias*, *Micropterygia*, etc.) vel muscos repens. Cel. MARTIUS primum invenit.

F ·4 × ·3; *lob* ·125; *c* $\frac{1}{4-5}$; *f*^{la} ·08; *br* ·5; *br*^{la} 45 × ·25, ·35 × ·25; *per* ·6 × ·3^{mm}.

Pusilla, fulva rufescensve, prostrata, in tegeticulam densam intricata. Caules pollicares, parce et subpinnatim ramosi, tenues sed tenaces.

Folia dissita, a basi assurgente hamato-decurva, falcato-dimidiata, semiovata, in acumen late subulatum acutum sensim angustata, margine postico (concavo) integerrima, antico profunde inciso-ciliata—quasi pectinata—ciliis 5–10, mediis longioribus caulique parallelis (ramulorum tenuiorum nonnunquam ad dentem unicum magnum redactis), sinuato-complicata; lobulus folio 3-plo brevior, semiovatus turgidus, dente apicali incurvo abscondito; cellulæ parvulæ, subconformes (ocellis nullis) paulo elongatæ subpapulosæ, vix incrassatæ, pellucidæ et fere vacuæ.—In planta viva cellulæ foliorum paucæ—solitariæ vel lineatæ—dense chlorophyllosæ, ceteris cellulis vacuis.

Foliola minuta, basin fere adusque bipartita, laciniis subulato-setaceis, 4–5 cellulis (plerumque uniseriatis) constantibus, erectis, parallelis.

Flores dioici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ, fl. sterilium incurvo-conniventes, fl. fertilium suberectæ, obovatæ, foliis submajores, ad ⅓ subinæqualiter bifidæ, vix complicatæ, segmentis tenui-acuminatis laciniatis—fere pinnatifidis—laciniis subulatis subhorizontalibus; bracteola oblongo-lanceolata, ad ⅓–½ bifida, profunde laciniata, lobis valde attenuatis.

Perianthia foliis dimidio longiora suburceolata (a basi conica ovato-oblonga) subretusa, rostellata, supra medium 5-carinata, carinis apice rotundo-prominulis, 2 posticis (v. omnibus) apice abrupte dilatatis, alas auriculasve fingentibus, tota facie papulosa, ad carinarum apicem cellulis pellucidis extantibus moniliata.

Amenta ♂ terminalia elongata julacea; bracteæ ad 20-jugæ imbricatæ subæqualiter complicatæ cymbiformes, lobis semiovatis acuminatis, ad carinam celluloso-moniliatæ.

2. DREPANO-LEJEUNEA ANOPLANTHA, Spruce.

Hab. In M. *Campana*, supra *Lej. porelloidem* S. repens. *S. Gabriel* et *S. Carlos* del *Rio Negro;* necnon ad fl. *Uaupés* ripas in truncis vetustis.

F ·35 × ·1; *lob* ·125; *c* $\frac{1}{55}$—$\frac{1}{50}$; *f*^{la} ·1; *br* ·4; *br*^{la} ·35 × ·2; *per* ·4 × ·3^{mm}.

Pusilla fulva dense prostrato-cæspitosa. Caules ¼–½-pollicares laxe pinnati v. subfasciculato-ramosi, ramique sæpe elongati.

Folia dissita assurgenti-subsecunda, apice deorsum hamata, suberecta (axi cauli fere parallelâ) anguste semilanceolata acuminata acuta, facie papulosa, margine celluloso-crenulata, sinuato-complicata; lobulus 3-plo brevior ovato-rotundus, e convolutione ovato-fusiformis, turgidus, margine inflexo cum caule angulum 45° efformante, apice obtuse recte prominulo; cellulæ parvæ pellucidæ subconformes.

Foliola fere 4-plo breviora, appressa, cuneata, bipartita, cruribus 3–4 c. longis, basi 2, superne 1 c., latis, angulo subacuto divergentibus, basi folioli integra 2 cell. alta.

Fl. dioici: ♀ in ramo sæpe perbrevi, terminales, innovatione simplice suffulti. Bracteæ foliis paulo longiores, multo latiores (arte explanatæ subrotundæ), antice posticeque (mediante bracteola) basi connatæ, conniventi-concavæ, vix ad ⅓ bilobæ, lobis haud complicatis, ovali-lanceolatis acuminatis pauci-spinulosis, lobulis perpaulo minoribus, altero breviore mutico; bracteola ovali-cuneata, ad ⅓–½ bifida, segmentis subacuminatis subspinulosis.

Perianthia vix emersa turgide obovata altiuscule 5-carinata brevi-rostellata inermia, fere lævissima, solum ad carinas subpapulosa.

Amenta ♂ terminalia; bracteæ paucijugæ majusculæ rotundo-galeiformes

compressulæ ore truncato vix bifidulæ, ad carinam cellulis exstantibus pellucidis uniseriatis quasi moniliatæ.

Planta Uaupensis ♂ folia habet tenui-acuminata minus papulosa; bracteas sublongiores (·5mm).

3. DREPANO-LEJEUNEA LONGIROSTRIS, Spruce.

Hab. In M. *Tunguragua*, supra filices (Hymenophylla) repens, alt. 2400m.

F ·4×·18, ·4×·13; *lob* ·15; *c* $\frac{1}{45}$–$\frac{1}{40}$; *f^la* ·08; *br* ·4; *per* ·65×·4 (*spinis inclusis*), *rostellum* ·15mm.

Pusilla rufo-badia. Caules ¼ poll. vage v. subpinnatim ramosi, ramis sæpe ascendentibus, raro aliis superne parvfoliis.

Folia subdissita pleraque assurgenti-subsecunda apice deorsum valide hamata, alia tamen (latiora) planiora solum apice decurvula, dimidiato-lanceolata sensim acuminata acuta, margine (sæpe valide recurvo) spinuloso-denticulata, dentibus obtusiusculis inæqualibus, uno alterove supra lobuli sinum cæteris sæpius submajore, subpapulosa; lobulus fere 3-plo brevior ovoideus turgidus apice acuto occulto; cellulæ parvulæ parum elongatæ vix incrassatæ parum chlorophyllosæ, suprabasales longiores vix autem in ocellum aggregatæ.

Foliola minuta foliis 5-plo breviora bipartita, basi 2–3 c. alta, segmentis divergentibus 4–5 c. longis, basi 2 c., apice lc. latis, radicellis in haustorium peltatum sæpissime colligatis.

Fl. monoici: ♀ in ramo sæpe perbrevi terminales, cum innovatione simplice. Bracteæ foliis caulinis subæquales utrinque alte connatæ, suberectæ, inæqualiter bilobæ, lobo subulato, lobulo subquadrato bifido, spinoso-denticulatæ; bracteola brevior subrectangularis ad ⅓ bifida, segmentis subacuminatis.

Perianthia altiuscule emersa obovato-obpyramidata, alte 5-carinata, carinis sub apice horizontaliter dilatato subulato paucispinis, supra carinas *in rostellum prælongum validum* elongata, demum 5-fida valvulis tamen (cum rostelli laciniis linearibus) fere erectis.

Andrœcia ramos terminantia; bracteæ pauci-plurijugæ majusculæ complicato-naviculares, bilobæ, lobo anteriore submajore cuspide aucto, ad carinam plus minus cellulis pellucidis moniliatæ.

4. DREPANO-LEJEUNEA CAPULATA, Tayl.

In Lond. Journ. Bot. 1846, p. 394.

Hab. Ad fl. *Negro* et *Uaupés*, in arborum foliis, imo in plantis herbaceis (*e.g.* in *Dithyrocarpi* sp.), sæpe alias *Lejeuneas* infestans.

F·25×·07, ·2×·1, *lob* ·1–·12; *c* $\frac{1}{70}$–$\frac{1}{60}$; (*f^la* 3 *c. longa;*) *br* ·3; *per* ·35–·4×·3mm (*sine spinis*).

Minuta viridis effusa. Caules ⅛–¼ poll. parum ramosi, raro subpinnati, ramis paucis elongatis.

Folia distantia patula assurgentia apice valide hamata, ovato-subulata acuminata, apice tenui cellulas 3 uniseriatas constante, basi cum lobulo (duplo breviore, fere æquilato) in sacculum ovoideum apice obtuse prominulum convoluta, margine postico ad lobuli apicem spina maxima sæpe deorsum spectante armata, cæterum subintegerrimo, antico pauci-(sub 3-) spinuloso integerrimove, haud raro expla-

nata, v. (lobulo obsoleto) cuneato-lanceolata fere ad medium usque bi-tridentata, dente spinave media longiore; cellulæ minutæ, oblongo-5–6-gonæ, subplanæ, subpellucidæ.

Foliola minuta, bipartita, cruribus subulatis 3–4 c. longis subdivergentibus.

Fl. dioici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis majores erectæ altiuscule connatæ bilobæ laxe complicatæ, ciliatæ v. saltem spinulosæ, lobo acuminato, lobulo truncato-bi-tri-ciliato; bracteola vix ad medium bifida, segmentis subacuminatis, oblonga.

Perianthia emersa, f. caulinis fere duplo longiora, obpyramidata late recte truncata brevi-rostellata, alte 5-carinata, carinis apice in cornua triangulari-acuminata ciliata—raro solum spinulosa—horizontaliter dilatata.

Androœcia terminalia, interdum longispica; bracteæ subcontiguæ majusculæ rotundo-naviculares, carina celluloso-moniliatæ.

E. foliis "singulari dente spinoso prope lobulum ad instar sicæ manubrii armatis" certe eadem ac *L. capulata* Tayl., in *Oware* Africæ a PALISOT lecta, videtur. De bracteis involucri ciliatis tamen cl. auctor mentionem haud fecit.

5. DREPANO-LEJEUNEA LICHENICOLA, Spruce.

Hab. In M. *Guayrapata*, super lichenes (*Stictas*) repens.

Facie, magnitudineque *D.-L. capulatæ* aliisque sat similis, diversa tamen caracteribus sequentibus.—Folia hamata, supra basin inflato-lobulatam late falcato-subulata, apice tenui acuta, margine inæqualiter spinoso-denticulata, dente supra-lobulari cæteris majore (ut in plurimis congeneribus); cellulæ subplanæ subelongatæ, ocelliformes pro more nullæ.—Foliolorum crura latissime divaricata 3–4 c. longa.—Flores dioici.—Perianthia *subimmersa rotundo-obovata-urceolatave* brevissime rostellata, 5-gona, *angulis parum prominulis subdenticulatis*, apice tamen in cornua brevi-triangularia acuta parum assurgentia dilatata.

6. DREPANO-LEJEUNEA INFUNDIBULATA, Spruce.

Hab. Chimborazo, in folio, cum aliis *Lejeuneis* intexta.

F ·4 × ·25; *lob* ·125; *c* $\frac{1}{60}$–$\frac{1}{55}$; *f*^{la} ·08; *br* ·45; *per* ·8 × ·38^{mm}.

Pusilla, pallida, tenuis. Caules $\frac{1}{8}$-pollicares prostrati subramosi.

Folia subdissita, fere plana, apice decurvula, a basi constricta abrupte dilatata, dimidiato-ovata—caulina latiora subtriangularia—subacuminata v. solum acuta, hic illic muricato-serrulata, dente supralobulari interdum majore, subsinuato-complicata; lobulus plus 3-plo brevior ovato-oblongus turgidus exciso-acutus; cellulæ minutulæ leptodermes fere vacuæ parum elongatæ, ocelliformes nullæ.

Foliola minuta bipartita, cruribus setaceis 2–4 c. longis sæpe valde divaricatis.

Flores dioici; ♀ in ramo brevi terminales, cum innovatione. Bracteæ foliis vix majores suberectæ alte connatæ, ad $\frac{1}{2}$ bilobæ; lobo lanceolato acuminato, lobulo brevi truncato-bidentello, spinuloso-subserratæ; bracteola fere ad $\frac{1}{2}$ bifida.

Perianthia maxima, f. caulinis 2-plo longiora, clavata—demum (ore fisso,

paululum hiante) infundibuliformia—basi angusta, supra medium 5-carinata, carinis superne in subulam latam peracutam fere horizontaliter dilatatis, rostello breviusculo. Capsula paulo exserta.

L. campanulata foliis latis subplanis affinis, differt perianthio multo breviore turgido urceolato, carinis apice spinis armatis.

Anne eadem ac "*L. tenuis* Nees" (S. H. 390, n. 199) quoad plantam Guianensem? *A. L. tenui*, typica, Javanica, tamen distincta videtur.

7. DREPANO-LEJEUNEA CAMPANULATA, Spruce.

Hab. In M. *Tunguragua*, *Chimborazo* et *Azuay*, alt. 3000^{m}, super filices et arborum folia repens, sæpe cum *Lejeunea planiuscula* admixta.

F ·5 × ·15, ·4 × ·08; *lob* ·10–·15; *c* $\frac{1}{3}$–$\frac{1}{5}$; *f*^{la} ·07; *br* ·55; *per* ·5 × ·25^{mm}.

Pusilla pallida fulvave; caules $\frac{1}{4}$-pollicares debiles valde intricato-ramosi, laxe pinnati et bipinnati, radicellosi.

Folia dissita assurgentia, plus minus hamata v. solum apice decurvula, oblique anguste lanceolata sensim acuminata acuta subdenticulata, ad lobuli apicem subspinulosa, raro fere integerrima, margine plano v. recurvulo, subsinuato-complicata; lobulus sub 4-plo brevior ovoideus turgidus exciso-acutus; cellulæ parvæ minutulæve oblongo-hexagonæ subpellucidæ haud incrassatæ, marginalibus exceptis subplanæ, paucæ inferiores majores vacuæ, sparsæ vel in ocellum aggregatæ.

Foliola 7-plo minora bipartita, segmentis angulo recto divergentibus subulato-setaceis breviusculis (3–4 c. longis).

Flores dioici: ♀ in ramo brevissimo, innovatione simplice suffulti; raro in ipso caule (vel in ramo) iterum prolifero, terminales. Bracteæ erecto-hamatæ, utrinque alte connatæ, foliis subæquilongæ, inæqualiter ultra medium bilobæ, subspinulosæ, lobo lanceolato-subulato acuto, lobulo subquadrato apice bidentato; bracteola angusta ad $\frac{1}{3}$ bifida, segmentis acutis.

Perianthia vix emersa urceolata tenuia pellucida, minus alte 5-carinata, carinis apice 2–3-spinosis, demum—vel sæpius ab initio—ore hiante recurvo inciso 12–15-dentato, companulata.

Plantæ ♂ cum ♀ intextæ, vix extricabiles. Androecia in ramis terminalia; bracteæ sæpius plurijugæ majusculæ contiguæ naviculares apice bifidæ; lobis subacutis, antico paulo majore, ad carinam cellulis pellucidis extantibus muriculatæ.

L. longirostris certe distincta erit: colore saturate rufo; foliis sublatioribus magis spinulosis valde hamatis, cellulis submajoribus; præcipue autem perianthiis longioribus longissime rostratis, carinis infra rostellum horizontaliter dilatatis spinosisque, fructu egresso, fere clausis, rostello autem 5-fido, laciniis linearibus suberectis.

8. DREPANO-LEJEUNEA PLANIUSCULA, Spruce.

Hab. In M. *Tunguragua*, *Guayrapata*, *Campana*, etc., super arborum folia, lichenes, etc., sæpe aliis *Lejeuneis* consociata.

F ·5 × ·3, *lob* ·1–·125; *c* $\frac{1}{60}$–$\frac{1}{55}$; *f*^{la} ·125; *br* ·5; *br*^{la} ·45 × ·15; *per* ·6 × ·55^{mm} (*alis inclusis*).

Pusilla, pallida viridisve; caules $\frac{1}{4}$ poll. prostrati pinnatim ramosi, ramis assurgentibus, aliis apice sensim minutifoliis.

Folia dissita patentia dimidiato-ovato-lanceolata lanceolatave subacuminata acuta inæqualiter spinuloso-denticulata, raro subintegerrima, pleraque subplana, pauca deorsum subhamata, subrecte complicata; lobulus 4–5-plo brevior ovoideus inflatus, acuminulato-acutus; cellulæ minutulæ subæquilateræ leptodermes, marginalibus exceptis subplanæ, inferiores sensim longiores paucæ (nullæve) majores vacuæ ocelliformes.

Foliola 4-plo breviora bipartita, cruribus subulato-setaceis 4–5 c. longis angulo prælato, sæpe 180°, divaricatis.

Flores dioici: ♀ in ramo persæpe brevi terminales, cum innovatione simplice. Bracteæ foliis subæquales, erectæ, fere liberæ, bilobæ, vix complicatæ, subspinulosæ, lobo subulato-acuminato, lobulo multo breviore apice bidentato; bracteola angusta fere linearis apice bifida.

Perianthia subemersa urceolata prælte 5-carinata, apice lato recte truncato clauso brevissime rostellata, carinis apice dilatatis alaque pauciaciniata auctis.

Andrœcia terminalia sæpe polyphylla; bracteæ rotundo-naviculares subæqualiter complicatæ submuticæ, ad carinam pellucido-muricatæ.

L. inchoata Meissn. (Syn. H. 343) descripta est "foliis divergentibus sursumque versis," . . . "amphigastriis ovato-triangularibus;" cæterum nostrati tam similis quod eandem speciem esse fere censerem.

Obs. At Baños, at the foot of Tunguragua, I gathered a form beset with a thick coating of adventitious ramuli, arising either from the leaves or (rarely) from the branches. They bear leaves reduced almost entirely to the basal sac, beyond which the lobe projects as a small triangular dentiform limb.—The flagelliform branches of the normal state bear small pellucid ovate acute leaves almost or quite destitute of basal sac.

SUBGENUS XXIII.—*LEPTO-LEJEUNEA*, S.

Pusilla, matrici arctissime adhærens, planissima, pallide viridis flavidave raro fuscidula. Caules ¼–1 poll. longi, sæpe in orbem radiati, pinnatim ramosi.

Folia horizontalia, dissita contiguave, siccando immutata v. recurvo-crispa, pro more anguste oblonga, 2–3-plo longiora quam lata, rotundata, rarius subacuta, rarissime 2–3-cuspidata, integerrima v. rarissime hic illic paucidenticulata, recte complicata; lobulus 2–4-plo brevior rhomboideus subplanus interdum obsoletus; cellulæ mediocres, pariete subincrassato vel non, inferiores paucæ persæpe duplo majores in ocellum irregularem aggregatæ.

Foliola parva bipartita, basi brevissime late cuneata, segmentis setaceis divergentibus, elongatis—raro basi altiora, cruribus ad cellulam unicam redactis.

Flores monoici, in paucis dioici: ♀ in ramo brevissimo terminales—quasi-laterales, innovatione in perpaucis brevi simplice, in plurimis nulla, suffulti. Bracteæ foliis subæquimagnæ parum inæquilobæ, sæpius obtusæ, integerrimæ vel serrulatæ, cum bracteola lanceolata bifida alte connatæ.

Perianthia emersa obpyramidato-5-carinata, carinis apice dilatato trun-

catis—interdum in cornu subulatum subhorizontale protractis, lævibus v. apice scabris.
Androecia ramulum totum v. ejus apicem solum tenentia; bracteæ 3-6-jugæ foliis paulo minores laxiusculæ, diandræ.

Hab. fere constanter foliicola, in arboribus, raro etiam in herbis filicibusque; rarissime in ramulorum cortice. In planitie abundant, in montibus humilioribus rariores, altioribus omnino exules.

Distr. In sylva Amazonica, rarius etiam in Andium devexis tam occidentalibus quam orientalibus, paulo supra 1000^{m} ascendentes, 6 species legi, quarum 3 novas; cæterum *L. elliptica* L. et L. per Americam tropicam late dispersa est; *L. polyrhiza* Nees et *crucianella* Tayl. jam antea in Guiana Gallica et Anglica inventæ fuerunt. E regione palæotropica habemus *L. vitrea* Nees (Java, Manila, etc.) et *L. elliptica* (ex insulis oceanicis et Ceylon).

§ 1. *Rami* ♀ *simplices.*

A. *Flores monoici.*

1. *L.-L. elliptica.* F. oblongo-lanceolata obtusa v. subacuta basi parviocellata; cellulæ leptodermes. Foliolum infraaflorale parvulum cuneatum integrum. Br. cuneatæ ad $\frac{1}{2}$ bifidæ. Perianthia breviter obpyramidata, carinis truncato-cornutis integerrimis.
2. *L.-L. exocellata.* F. obovato-lanceolata exocellata; cellulæ pariete subincrassato. Foliolum infraflorale majusculum truncato-bicuspidatum. Br. late lineares breviter bifidæ.

B. *Flores dioici.*

3. *L.-L. ligulata.* F. ligulato-oblonga fere 3-plo longiora quam lata. Foliolum infraflorale magnum pentagonum truncato-biapiculatum. Per. clavato-pyriformia, carinis apice in cornu subulatum dilatatis.

§ 2. *Rami* ♀ *innovatione brevi simplice aucti.*

4. *L.-L. polyrhiza.* F. in sicco flavida rhomboideo-oblonga basin versus plerumque grandi-ocellata. Per. urceolata 5 carinata, carinis superne alæformibus, apice truncato (angulo externo peracuto) subspinulosis.

§ 3. *Fl.* ♀ *ignoti.*

5. *L.-L. crucianella.* F. rhomboidea apice 3-cuspidata. Foliola bipartita, cruribus setaceis, altero sæpe obsoleto.
6. *L.-L. trigonostipa.* F. lanceolata acuta obsolete denticulata, ocellata. Foliola obtriangularia apice prælato truncato minute biapiculata.

1. LEPTO-LEJEUNEA ELLIPTICA (L. et L.)

Jung. elliptica L. et Lg. in Lehm. Pug. V, 13; *Lejeunea e.* Syn. Hep. 403.

Hab. In sylvis fl. *Negro*, ad arborum folia, frequens, præcipue juxta cataractas.—Per Americam tropicam dispersa videtur.

F ·35×·18; *lob* ·1 v 0; *c* $\frac{1}{4-5}$; f^{la} 3 c; *br* ·3–·35; br^{la} ·35×·8; *per* ·35×·25–·3; *br* ♂ ·15^{mm}.

Late effusa, tenuissima, pallide viridis, siccando subfuscescens difficillime emollitura. Caules arcte repentes $\frac{1}{4}$–$\frac{1}{2}$-pollicares laxe pinnati.

Folia dissita subplana oblique oblongo-lanceolata (long. = 2 lat.) v. subrhomboidea, obtusa v. subacuta, exocellata v. sæpius ocello parvo subbasali quasi-perforata, recte complicata; lobulus 3-plo brevior subrectangularis acutus subinflatus; cellulæ subparvæ valde leptodermes fere vacuæ, marginales paulo minores subquadratæ, inferiores sensim submajores, una alterave cæteris duplo majore ocellum sistente.

Foliola bipartita, basi integra brevissima cuneata; crura setacea tenuissima 3 c. longa subdivergentia.

Flores monoici: ♀ in ramo brevissimo terminales, innovatione nulla. Folium infraflorale unicum parvum subrotundum, foliolum parvulum cuneatum integerrimum. Bracteæ f. caulinis subæquilongæ cuneatæ ad ½ bifidæ, lobis triangularibus acutis, postico subminore; bracteola basi utrinque connata linearis v. subcuneata breviter bifida, segmentis acutis: omnes integerrimæ.

Perianthia vix emersa obpyramidata brevissime rostellata, 5-carinata, carinis superne sensim dilatatis apice truncatis acutis integerrimis.

Androecia ramulo cauligeno sistentia, raro ramum terminantia; bracteæ sub 3-jugæ laxiusculæ foliis plus duplo breviores ovoideo-rotundæ subæquilobæ.

2. LEPTO-LEJEUNEA EXOCELLATA, Spruce.

Hab. Andes Peruviæ ad *Tarapoto*, in foliis vivis.

F ·45×·25, *lob* ·1 v. 0; *c* $\frac{1}{45}$; f^{la} ·1; *br.* ·3; *per* ·5×·3; *androecia* ·4–·5×·4^{mm}.

Pusilla pallida in sicco subfuscescens, tenera, in maculas circumscriptas prostrata. Caules ¼–½-pollicares arcte repentes pinnatim ramosi.

Folia dissita pellucida plana suboblique ovali-vel obovato-lanceolata subacuta, rarius obtusata, exocellata; lobulus rectus parvus rhomboideus incurvus, interdum obsoletus; cellulæ subparvæ hexagonæ, marginales quadratæ, subobscuræ, intus sinuatæ, parietibus subincrassatis, paucæ subbasales ceteris sensim submajores neque in ocellum aggregatæ, omnes subplanæ.

Foliola distantia bipartita, disco radicellifero cum cruribus subulato-setaceis 4 cell. longis divergentibus constantia.

Flores monoici: ♀ in ramo simplice brevissimo, folio unico parvo rotundo folioloque majusculo 5-gono-rotundo, apice lato truncato bicuspidato, stipato, terminales. Bracteæ foliis ½ breviores ligulatæ v. lato-lineares subplanæ (nec complicatæ) bracteolaque conformis basi connata apice breviter bifidæ, segmentis erectis linearibus obtusis, integerrimæ.

Perianthia emersa f. caulinis sublongiora obpyramidato-pyriformia, sæpe incurva, 5-carinata, vix rostellata, carinis superne sensim dilatatis, apice lato subhorizontaliter truncatis v. 2 posticis in cornua brevissima porrectis, sublævissimis.

Androecia cauligena, pro plantula magna, ovato-globosa, compressa; bracteæ subtrijugæ confertæ foliis fere æquimagnæ obtuse complicatæ æquilobæ, brevissime bifidæ, lobis dimidiisve fere semicircularibus obtusis; antheridia bina magna.

Alia specimina ex eodem loco bracteas habent magis profunde bifidas lobis subinæqualibus, bracteolâ subacutâ.

Forsan pro var. *L. ellipticæ* habenda, differt autem statura submajore, foliis interdum basi angustatis (i.e. obovato-lanceolatis), constanter *exocellatis*, cellulis obscurioribus subpachydermibus, *foliolo infraflorali conspicuo pentagono bicuspidato*, perianthio majore, bracteis perangustis.

3. LEPTO-LEJEUNEA LIGULATA, Spruce.

Hab. In sylva Amazonica haud infrequens, circa *S. Gabriel* fluvii Negro præcipue, raro fertilis.

F ·4 × ·15, *lob* ·1, *c* $\frac{1}{40}$mm; *f^la* 3–4 *cellulas longa*; *br* ·35; *per* ·8 × ·35mm.

Pusilla arcte repens viridis, siccando fusca nigrescensve, haud facile emollienda. Caules in orbem diametro pollicarem radiati, subbipinnati, ramis sparsis, raro intricatis.

Folia distantia patentia plana, siccando recurvo-crispula, ligulato-oblongalanceolatave, triplo fere longiora quam lata, obtusata, subrecte complicata; lobulus 4-plo brevior ovato-fusiformis inflatus; cellulæ parvulæ subconformes 4–6-gonæ, parum elongatæ pellucidæ (fuscidulæ tamen), chlorophyllo parco, pariete ad angulos et media latera subincrassato.

Foliola distantia minuta bipartita, cruribus divaricatis subulato-setaceis 3–4 cellulas longis, basi 2 cell. latis.

Flores dioici; ♀ in ramo perbrevi, foliis minutis unijugis (vel unico) cum foliolo magno difformi, stipato, terminales, innovatione nulla. Bracteæ foliis caulinis subbreviores, obovatæ ad $\frac{1}{3}$ bilobæ, lobis obtusatis, postico paulo angustiore; bracteola utrinque cum bracteis altiuscule connata lanceolata ad $\frac{1}{4}$ bifida, segmentis acuminulatis. Foliolum infraflorale (sive bracteola exterior) caulinis valde diversum, dimidium folium excedens, orbiculari-pentagonum, apice truncato-biapiculatum, textura firma subopaca.

Perianthia alte emersa clavato-pyriformia, superne 5-carinata, carinis in cornua breviuscule subulato-acuminata patentia protractis.

A *L. polyrhiza* floribus dioicis, ramo ♀ haud innovato, foliis lobulatis exocellatis, cornibus perianthii patentibus, bene distincta.

4. LEPTO-LEJEUNEA POLYRHIZA, Nees.

In G. L. et N. Syn. Hep. 403.

Hab. In sylva Amazonica, præcipue ad fl. *Negro* superiorem, frequens, foliicola; etiam in Guiana Gallica.

F ·35 × ·2, ·25 × ·15; *c* $\frac{1}{60}$–$\frac{1}{40}$; *f^la* ·15; *br. lob.* 35; *br^la* ·35 × ·13; *per* ·4 × ·35mm.

Pusilla, viridis, siccando flavida, sat facile emollitura, arcte repens. Caules $\frac{1}{4}$–$\frac{1}{2}$ pollicares, pinnati et bipinnati, rami crebri—sæpe eodem numero ac folia caulina—ramulique paucifolii, foliis ad singulum ramulum 3–5-jugis.

Folia contigua patula (angulo axiali 70°) subassurgentia, rhomboideo-oblonga subacuta v. sæpius obtusata, plana, margine autem recurvulo repando opaco, ocellata; lobulus sæpissime 0, ramorum rariu præsens, $\frac{1}{2}$ folio paulo brevior, lineari-rhomboideus apiculato-acutus subplanus; cellulæ mediæ parvulæ pellucidæ vix incrassatæ, 2–1s inferiores duplo majores v sparsæ v. sæpius in lineam maculam0

collectæ, marginales autem mediis $\frac{1}{2}$ minores opacæ; omnes parum prominulæ.

Foliola bipartita: crura divaricata, fere horizontalia, setacea, cellulas 4–6 uniseriatas (basi sola biseriatas) longa, ramorum breviora minus divergentia. Radicellæ in discum radiatæ, sæpe in mucum solutæ.

Flores monoici: ♀ in ramo brevi, foliis 1–2-jugis vestito, raro longiore, terminales, innovatione brevi (foliis 2–3-jugis stipatis) suffulti. Foliolum infraflorale ovale, ultra $\frac{1}{2}$ bifidum, segmentis acuminatis. Bracteæ foliis æquilongæ serrulatæ, cum bracteola æquilonga lanceolata, ad $\frac{1}{3}$ bifida, segmentis acuminatis, alte connatæ, bilobæ subcomplicatæ, lobo ovali obtuso acutove, lobulo paulo breviore duplo angustiore apice bidentulo.

Perianthia paulo emersa late obpyramidato-urceolata vix compressa 5-carinata, carinis superne alæformi-dilatatis truncatis apiceque triangulari acuto v. subacuminato papillosis spinulosisve, apice ipsius perianthii conum humillimum sistente.

Androecia ramos terminantia; bracteæ sub 3-jugæ laxiusculæ foliis sensim minores cymbiformes inæqualiter bilobæ.

Ad S. Gabriel advenit altera forma foliis minus conspicue ocellatis, margine pellucente vix recurvulo celluloso-erosulo, androeciis lateralibus.

5. LEPTO-LEJEUNEA CRUCIANELLA, Tayl.

In Lond. Journ. Bot. (1846), p. 393. G. L. et N. Syn. Nep. 757.

Hab. *Manáos*, ad fl. *Negro* ostia, in arborum foliis et filicibus repens. *Demerara*, in *Radulæ* sp. repens (fide Taylor).

F ·18 × ·08, *lob* ·07^{mm}.

Minuta viridis, siccando fuscidula. Caules $\frac{1}{4}$-pollicares arcte repentes laxe subpinnati.

Folia dissita rhomboidea vel rectangulari-oblonga, apice plerumque 3-cuspidata, dente medio triangulari-acuminato vel late subulato, antico sæpe obsoleto, recte complicata (vel non); lobulus vix triplo brevior rhomboideus planus vel convoluto-subinflatus, persæpe nullus; cellulæ parvulæ subconformes subelongatæ.

Foliola bi-(raro uni-) crura, interdum obsoleta; cruribus subulato-setaceis 4 cell. longis.

Flores dioici: ♀ non aderant. Androecia in ramis terminalia subjulacea; bracteæ 3–5-jugæ, foliis paulo breviores ovoideæ muticæ.

6. LEPTO-LEJEUNEA TRIGONOSTIPA, Spruce.

Hab. *Chimborazo*, in arboris folio, aliis *Lejeuneis* immixta.

F ·55 × ·25, *lob* ·18; *c* $\frac{1}{30}$^{mm}.

Pusilla tenuis flaccida, pallida, siccando fuscidula. Caules $\frac{1}{4}$-pollicares prostrati laxe pinnati.

Folia dissita patula fere plana lanceolata acuta hic illic cellula exstante crenulata denticulatave, recte complicata; lobulus 3-plo brevior, solum ad plicam inflatus, ovalis truncatus apiculato-acutus; cellulæ leptodermes, vix chlorophylliferæ, paucæ (sub 8) basin versus cæteris longiores, vacuæ, sæpe in series 2 contiguas lineares congestæ.

Foliola minuta obtriangularia apice prælate truncato utrinque cellula unica parva apiculata, radicelliferæ—sæpe tam foliola quam radicellæ in mucum soluta.

Amenta ♂ f. caulino duplo longiora; bracteæ laxe julaceo-imbricatæ sub 6-jugæ subrotundo-saccatæ compressæ.

Foliis *L. stenophyllæ* L. et G. Syn. Hep. 769, sat similis, foliolis longe diversa.

SUBGENUS XXIV.—*CERATO-LEJEUNEA*, S.

Plantæ pusillæ vel sat robustæ, colore lurido sæpissime insignes, nitidæ tamen interdumque quasi vernicosæ, rufescentes, rufo-badiæ vel fere nigræ, rarissime pallidæ vel virescentes, post siccationem facile aqua saturandæ, citoque iterum exsiccandæ, cæspites depressos, sæpe latissimos denseque stratificatos efficientes. Caules prostrati, vix unquam suberecti, ramis autem in paucis speciebus assurgentibus; sat validi, inæqualiter (raro symmetrice) pinnatim ramosi.

Folia contigua vel sæpius subimbricata, nunquam densa, apice plus minus decurva, in sicco insigniter fornicata involutave, oblique ovata oblongave, aliorum specierum dimidiata subfalcataque, inferiora sæpius obtusa rotundatave, superiora sæpe subacuta, raro acuminata, apice v. integerrima v. (sæpeque in eadem specie) dentata, raro toto fere margine serrulata, basi plerumque cellulis paucis magnis ocellata; cæteræ cellulæ subparvæ pellucidæ, pariete fere semper tenui fusciduło; lobulus parvus minutusve inflatus, raro obsoletus, foliorum rameorum tamen 2 infimorum sæpe maximus, imo totum folium in utriculum reniformem facie supera perforatum involvens.

Foliola in pusillis parva, foliis caulinis 3–6-plo breviora, subrotunda, ad ½ bifida, in elatioribus cordato-ovata-reniformiave, folii dimidium v. totum æquantia, apice pro more breviter bifida bidentatave, in omnibus integerrima vel rarissime utrinque 1-dentata (in *L. Brasiliensi*, quam nondum vidi, "denticulata" dicuntur).

Flores in aliis monoici, in aliis dioici. Ramus ♀ brevis longiorve—nunquam ad florem solum redactus—plerumque uniflorus, semper tamen innovatione, vel unilaterali vel duabus oppositis, auctus. Br. erectæ foliis subsimiles, plerumque acutiores magisque dentatæ, lobulo majore explanato; bracteola plus minus late ovalis bifida.

Perianthia pro more emersa, urni-vel pyriformia vel obconica, 4- (raro 5-) carinata, carinis plerumque humilibus, sæpe papulosis, ultra perianthii apicem truncatum brevi-rostellatum fere constanter in cornua breviora longiorave—interdum longissima—varie patula, protractis. Capsula subglobosa.

Andrœcia fere semper ramulo proprio constantia, raro terminalia, breviraro longi-spica; bracteæ in paucis minutæ, in plurimis majusculæ.

Hab. et *Distr.* In sylvis Amazonicis umbrosissimis, præcipue ripariis, valde frequens, ad arborum corticem, ramulos et folia viva, ad truncos inundatos (raro ad putrescentes) saxaque, plagas sæpe prælatas, interdum pro aspectu funereo insignes, efficiens. In Andium montes humiliores raro et sporadice ascendit; in sylva Canelos autem, alt. 1000–1500 m. species duas pulchras, ut videtur novas, reperi; in M. Chimborazo, eadem altitudine, speciem singularem, *L. spinosam* Gottsche, antea in insulis Antillanis inventam, legi. In tota America tropica abundare videntur species, in cæteris terris tropicis tamen multo rariores.—Bene dicunt cl. auctores 'Synopseos Hepat.' "Plantæ hujus sectionis inter se maxime congruæ difficillime sunt

dignoscendæ." In sylvis Amazonicis formas innumeras maximâ copiâ legi, easdemque iteratim examinavi, inter fere omnes tamen limites specificos mihi satisfaciendos frustra quæsivi.—E speciebus circiter 17 autem a meipso lectis 12 novæ videntur.

Obs. Cum hoc subgenere congruit pro majore parte *Lejeunca* § 3 *Ceratanthæ* Syn. Hep. p. 395 et seq.

A. *Foliola parva, foliis caulinis 3–6-plo minora, subrotunda, nunquam cordata.*—Plantæ pro more pusillæ, rufo-badiæ, raro pallidæ, nunquam nigricantes.

a. *Flores monoici.*

a_1. *Caules symmetrice pinnati bipinnative. Folia siccando margine valide incurva exindeque ad speciem dissita. Utriculi magni crebri. Andrœcia tenuispica, bracteis minutis laxiusculis.*

1. *C.-L. plumula.* Folia falcato-divergentia, semiovata; superiora rameaque subacuta, margineque fere toto argute serrulata, basi ocellata. Foliola foliis caulinis 6-plo breviora ovalia ad ½ bifida. Bracteæ serrulatæ; bracteola ligulato-oblonga breviter bifida subintegerrima. Perianthia parva subturbinata obscure 4-gona longicornia, cornibus erectis linearibus compressis.
2. *C.-L. megalophysa.* A pr. differt foliis omnibus paucidenticulatis integerrimisve, exocellatis; foliolis duplo majoribus; bracteola ovali-orbiculata; perianthii argute carinati cornibus perbrevibus patentissimis.

a_2. *Caules inæqualiter pinnatim vel vage ramosi. Folia siccando apice valide decurva devolutave. Utriculi nulli, vel perrari parvique. Br. ♂ majusculæ confertiusculæ.*

3. *C.-L. cubensis.* Caules subbipinnati, ramis assurgentibus. F. subfalcata divergentia fornicata dimidiato-ovata abrupte acuta, apice denticulata, basi ocellata, lobulo majusculo turgido. Foliola 3-plo breviora suborbiculata ad ½ bifida, segmentis acutis. Br. serrulatæ; bracteola lanceolata ad ⅓ fissa. Perianthia pyriformia 4-carinata, cornibus brevissimis erectis obtusis. Andrœcia longispica.—Var. *guianensis*, foliis planioribus sæpe obtusatis integerrimis, lobulo interdum obsoleto, br. sæpe integerrimis.
4. *C.-L. rigidula.* Caules elongati in planum laxe pinnati. F. obliqua (non prorsus dimidiata) acuta obtusave apice subserrulata, lobulo minuto obsoletove, obscure ocellata. Foliola 3–4-plo minora ovali-rotunda ad ½ fissa. Br. subserrulatæ; bracteola ovali-rotunda ad ⅓ fissa. Per. obconico-oblonga, 4-carinata, cornibus patentissimis tenuiusculis cæteri perianthii dimidium vix æquantibus. Andr. mediocria.

a a. *Flores dioici.*

5. *C.-L. commixta.* Caules subelongati subbipinnati. F. subcontigua planiuscula oblique ovata obtusata integerrima planiuscula ocellata, lobulo 4-plo breviore conspicuo. Foliola vix 3-plo breviora ovali-rotunda ad ½ bifida. Br. subintegerrimæ; bracteola lanceolata ad ½ bifida. Per. obovato-oblonga, carinis valde pellucido-tuberculosis, cornibus perbrevibus late patulis.
6. *C.-L. monticola.* Caules cæspitosi suberecti parum ramosi. F. iis *L. cubensis* var. *guianensis* similia. Foliola ovato-rhombea ultra ½ bifida,

segmentis peracutis. Br. majores. Per. majora urceolata, cornibus brevi-conicis compressis fere horizontalibus. Andr. brevispica plerumq. terminalia.

7. *C.-L. luteola.* Albido-lutescens tenera, caule brevi repente paulo ramoso. F. oblique semicordato-ovata obtusata subintegerrima, lobulo inflato. Br. acutæ superne subserratæ; bracteola subovalis breviter bifida, utrinque bracteis connata.

8. *C.-L. caducifolia.* Pusilla rufescens, caule vage ramoso ramisque tenuibus e foliis deciduissimis plus minus denudatis. F. subcontigua late semiovato-oblonga falcata, apice rotundo obtusove, margine repando celluloso-crenulato, ocellata; cellulæ minutulæ. Foliola 4–5-plo breviora ovali-rotunda, sæpe utrinque 1-dentata, ultra ½ bifida. Ramus ♀ sæpe innovando-florifer. Br. integerrimæ. Per. obovata truncata 4-5-gona, ecornia.

B. *Foliola pro more magna, ½ folium subæquantia, nonnunquam maxima, foliis vix minora, sæpe cordata, haud raro reniformia.*—Plantæ robustiores, rufo-ferrugineæ-badiæve, aliæ nigricantes. Fl. ♀ frequenter dichotomiales.

b. *Flores monoici.*

9. *C.-L. Coarina.* Rufo-badia, caule elongato vage ramoso. F. semicordato-oblonga sæpius rotundata integerrima, raro apice subdenticulata, exocellata, lobulo inflato. Foliola inferiora parvula, superiora foliis duplo (v. perpaulo) minora cordato-orbiculata ad ⅓ bifida. Br. foliis minores, subacutæ sæpius integerrimæ; bracteola ovali-orbiculata ad ⅓ bifida. Per. alte emersa clavato-oblonga truncata, supra medium 4-carinata, cornibus vel 0 vel brevissimis triangularibus patulis. Andr. f. contiguo paulo longiora.

10. *C.-L. variabilis.* Rufo-badia raro nigricans. Caules inæqualiter pinnati et subbipinnati. F. late semicordato-ovata abrupte acuta integerrima, lobulo inflato, ocello nullo. Foliola increscentia, superiora foliis vix duplo breviora, interdum æquimagna, cordato-ovata oblata ad ⅓ bifida, segmentis acutis. Br. f. breviores subacutæ sæpius denticulatæ; bracteola ovalis vel suborbiculata ad ⅓ bifida, segmentis acuminatis. Per. obconica superne 4–5 carinata, cornibus elongatis subulatis patentibus. Andr. f. contiguo subæquilonga.—Var. *subserrata*, f. apice serrulatis, lobulo sæpe obsoleto, bracteis subspinulosis, perianthiis brevioribus.—Var. *saproxylophila*, f. apice serrulatis, foliolis maximis, ad ¼ alt. solum bifidis, br. acuminulatis inciso-serratis, per. cornibus fere horizontalibus.

11. *C.-L. rufo-pellucida.* Rufa insigniter pellucida. F. dimidiata subdivergentia, apice abrupte acuto argute v. subduplo serrulata, exocellata, lobulo inflato. Foliola superiora ½ f. superantia. Bracteæ acuminulatæ argute serrulatæ. Per. obpyramidato-cylindrica, cornibus longis late patentibus. Andr. longispica.

b b. *Flores dioici.*

12. *C.-L. fuliginosa.* Nigro-fusca. Caules elongati laxe subpinnati. F. inferiora dissita ligulato-oblonga, superiora subimbricata oblique ovato-oblonga rotundata, raro subacuta, exocellata. Foliola = ½ fol. raro majora, orbiculato-ovata ad ⅓ bifida, segmentis acutis.

13. *C.-L. hylophila.* Olivaceo-rufa. Caules vage ramosi vel ex p. dichotomi. F. subimbricata decurvo-concava subdivergentia, late semiovata rotundata subacutave integerrima exocellata, lobulo parvo

saccato. Foliola variabilia foliis fere æquimagna vel rarius 2–3-plo minora, sinu baseos profundo, apice ad $\frac{1}{4}$–$\frac{1}{3}$ bifida, segmentis subacutis. Br. serrulatæ acutæ, v. altera obtusa; bracteola ovalis rotundave breviter bifida serrulata. Per. elongata obconico-cylindracea, cornibus longis suberectis Andr. breviuscala.—Var. *subdenticulata*, foliis apice 2–3-denticulatis, foliolis subminoribus.

14. *C.-L. microrhegma.* Rufo-fusca. Caules paulo ramosi. F. patentissima subfalcata subsemicordato-oblonga, apice rotundato serrulata, exocellata, decurrenti-lobulata. Foliola foliis æquimagna insigniter cordato-reniformia, apice rima brevissima solum 4 c. alta bidentula. Fl. ♀ innovatione unilaterali. Br. spinulosæ, lobulo obtuso; bracteola ovalis apice bidentata basi constricta. Per. oblonga, cornibus prælongis suberectis.
15. *C.-L. maritima.* Rufo-badia, dense depresso-cæspitosa. F. oblique semiovato-oblonga, apice sæpius obtuso serrulata. Foliola subduplo breviora, superiora valde oblata reniformia, basi rotundata (nec cordata), apice breviter bifida, segmentis acuminatis. Andr. longispica.
16. *C.-L. platyceras.* Rufa. Caules inæqualiter pinnati. F. late dimidiato-ovata subacuminata acuta, margine fere toto argute dentato-serrata, parviocellata, lobulo saccato. Foliola 2–3-plo minora orbiculata ultra $\frac{1}{2}$ bifida, segmentis acuminulatis, serrulata. Br. acute crebre spinuloso-serratæ; bracteola ovali-lanceolata fere ad $\frac{1}{2}$ bifida serrulata. Per. urniformia, carinis 4 papulosis, cornibus patulis brevibus latis plerumque subevolutis ore hiante crenatis. Andr. brevispica sæpe terminalia.
17. *C.-L. spinosa.* Rufa, fragilis. Caules prælongi parce ramosi. F. oblique semicordato-ovata subulato-acuminata acuta, margine postico apiceque spinuloso-serrata, lobulo minuto, exocellata. Foliola f. duplo breviora ovata ultra $\frac{1}{2}$ bifida, segmentis tenui-acuminatis. Br. acuminatæ ciliato-spinosæ; bracteola ovata profunde bifida, segmentis longissime acuminatis, integerrima.

1. CERATO-LEJEUNEA PLUMULA, Spruce.

Hab. M. *Guayrapurina* Andium Peruv., ad filices (alt. 1000 m.); fl. *Negro* et *Uaupés* in arborum foliis; e rarioribus.

F ·85 × ·6; *lob* ·13; *c* $\frac{1}{10}$; *f*^{la} ·15 × ·12; *br* ·55; *per* ·55 × ·4; *br* ♂ ·1^{mm}.

Rufo-fusca prostrata arcte repens. Caules $\frac{1}{2}$–1 pollicares, pulchre plumæformi-pinnati raro subbipinnati.

Folia subimbricata falcata divergentia dimidiato-ovata obtusata v. abrupte acuta, basi antica dilatata subsemicordata, margine postico recto v. concavo in caulinis integerrima, antico rotundato supra medium apiceque angulata subdenticulatave, ramea tamen (caulinis duplo minora) margine fere toto argute serrulata, sinuato-complicata; lobulus parvus folio caulino 6-plo brevior ovatus inflatus exciso-acutus; cellulæ mediæ parvulæ, versus folii marginem anticum minores, versus posticum et inferiores majores, 3–6 prope basin cæteris duplo longiores in lineam ocellumve dispositæ. Utriculi magni ad ramorum basin frequenter adsunt, globoso-reniformes, facie interna subimpressi centroque perforati.

Foliola minuta foliis caulinis fere 6-plo breviora ovalia ad $\frac{1}{2}$ bifida, laciniis acutis.

Flores monoici : ♀ in ramo brevissimo terminales, innovatione simplice suffulti. Bracteæ foliis dimidio breviores complicato-bilobæ, lobo obovato apice serrulato, lobulo subbreviore angustioreque lanceolato; bracteola ligulato-oblonga breviter bifida subintegerrima.

Perianthia parva vix emersa badia obovata subturbinatave obscure 4-angula, demum fere teretia; apice in cornua 4, reliquo perianthio vix breviora, linearia, ligulata clavatave obtusata compressa erecta v. conniventia, porrecta.

Andrœcia ramulo tenui constantia ; bracteæ 4–6-jugæ minutæ subdissitæ naviculares dorso papulosæ.

Forma riparia, illa præcipue e *S. Carlos*, minus eleganter pinnata; folia tam caulina quam ramea argute serrata, basi vittata, ocellatave.

L. Splitgerberiana, Mont. (in Guiana lecta) caule bipinnatim decomposito, foliis semicircularibus *viridi-hyalinis*, et perianthio obconico *cornibus reflexis*, a nostra distincta, cæterum haud absimilis.

2. CERATO-LEJEUNEA MEGALOPHYSA, Spruce.

Hab. Ad fl. *Negro* cataractas et fl. *Uaupés*, in palmarum arborumque foliis.

L. plumulæ colore rufo, caule arcte pinnato, florescentiaque monoica convenit, differt ceteris caracteribus. Folia late dimidiato-ovata abrupte acuta obtusave, apicem versus *paucidenticulata*, vel caulina subintegerrima, subrecte lobulata, lobulo minuto, cellulis inferioribus sensim majoribus, *ocello proprio nullo*. *Foliola iis L. plumulæ duplo majora*, $=\frac{1}{3}$ folii, vix ultra $\frac{1}{2}$ bifida. Bracteæ pauciserrulatæ; bracteola ovali-orbiculata breviter bifida. Perianthia oblongo-urniformia minute rostellata, *alte argute* 4–5-*carinata*, carinis apice in *cornua perbrevia patentissima* subacuta vel truncato-denticulata dilatatis.—Utriculi magni crebri.—Folia qualia *L. plumulæ* insigniter incurvo-canaliculata, unde planta crispula evadit, post siccationem præcipue.

3. CERATO-LEJEUNEA CUBENSIS, Mont.

Hist. physic. etc. de Cuba, 481, t. 18, f. 2.

Hab. Per totum flumen *Negro*, in arborum truncis ramulisque, raro in rupibus.

F ·45 × ·35 ; *lob* ·15 ; *c* $\frac{1}{55}$–$\frac{1}{50}$; f^{ta} ·15 × ·15 ; *br. lob* ·55 × ·33 ; br^{ta} ·4 × ·2; *per* ·55 × 35^{mm}.

Pusilla, cæspitosa, e viridi rufula, sicca flavida. Caules $\frac{1}{3}$–$\frac{1}{2}$-pollicares prostrati inæqualiter subbipinnati, ramis brevibus assurgentibus arcuatis.

Folia imbricata decurvo-fornicata subfalcata dimidiato-ovata oblique abrupte acuta, margine antico apice denticulata raro subintegerrima, subsinuato-complicata ; lobulus triplo brevior sat conspicuus subtransversus semiovatus turgidus, rarissime ad plicam redactus obsoletusve; cellulæ fere minutulæ pellucidæ ambitu anguste opacæ, 1–4 prope folii basin duplo longiores primum materia grumosa obscuratæ, demum vacuæ. Utriculi nulli vel rarissimi.

Foliola dissita folio 3-plo breviora suborbiculata, ad vel paulo ultra $\frac{1}{2}$ bifida, segmentis acutis.

Flores monoici ; ♀ in ramo brevi longioreve terminales, innovatione simplice suffulti. Bracteæ foliis sublongiores, ad ¾ bifidæ, complicatæ, acutæ, subserrulatæ v. grosse serratæ, raro fere integerrimæ, lobis obovato-lanceolatis, inferiore breviore angustioreque ; bracteola lanceolata ad ⅓ bifida, segmentis acutis, integerrima.

Perianthia vix emersa pyriformia subcompressa, marginibus acute carinatis, postice ventricosa obscure bicarinulata, apice in 3 v. 4 umbones cornuave brevissima erecta obtusa producta, demum 3–4-fida. Capsula sphærica.

Andrœcia pro more longispica, ramum totum—raro ejus apicem solum—tenentia, julacea ; bracteæ 4–10-jugæ sat magnæ imbricatæ.

Prope *Manãos* fluminis *Negro*, in arboribus humilibus planitiei arenosi "Umirisál" dicti, advenit forma pulchella dense cæspitoso-stratificata, foliolis late ovalibus apicibus acuminatis.

The *ocellus* near the base of each leaf consists normally of 2 (rarely more) enlarged cells, covered on their under surface with a grumous greenish waxy mass, which is easily removable and finally falls away, leaving the cells scariose, pellucid and nearly empty. It therefore probably exudes from the cells, but whether it is a fungous growth, or a morbid state of the chlorophyl I am unable to say.

Var. *guianensis* N. et Mont. (sp.), Mont. in Ann. Sc. Nat. 1840.

Hab. Pará, ad arborum truncos, cum *Frullania exilis* Tayl., necnon per fl. *Negro* sylvas.

Pro *L. Cubensis* var. habenda; differt autem caule longiori, sæpe pollicari, in planum fere ramoso; foliis planioribus rotundatis obtusatisve raro subacutis, fere constanter integerrimis, lobulo 4-plo breviore haud raro obsoleto; foliolis foliis 4-plo minoribus; ramis ♀ sæpe iteratim innovatis; bracteis integerrimis raro serrulatis ; perianthii cornibus perbrevibus quidem paulo distinctioribus quam in typo. —L. *Martiana* Gottsche, Syn. Hep. probabiliter pro *L. guianensis* forma habenda.

4. CERATO-LEJEUNEA RIGIDULA, Nees et Mont.

Ann. Sc. Nat. 1840; G. L. et N. Syn. Hep. 371.

Hab. In fl. *Negro* sylvis, ad arborum truncos, ramulos foliaque viva, necnon in palmarum foliis, nunquam in truncis putrescentibus. Guiana Gallica (*Leprieur*).

F ·7 × ·5, ·6 × ·43, ·55 × ·4; *lob* ·1; *c* $\frac{1}{4\,5}$–$\frac{1}{4\,0}$; f^{la} ·2–·15; *br*· 6; br^{la} ·4 × ·35; *per* ·75 × ·4 (*lat. infra cornua*) 4^{mm}.

Rufo-badia prostrata. Caules 2-pollicares tenues flexuosi laxe pinnati, ramis planis, raro subbipinnati.

Folia parum imbricata subfalcata oblique semiovato-oblonga, apice oblique acuto obtusove subserrulata raro integerrima, subrecte complicata; lobulus minutus ovatus inflatus interdum obsoletus; cellulæ parvulæ pellucidæ, 5 v. 6 basin versus majores ocellum indistinctum efformantes. Utriculi rari.

Foliola foliis 3–4-plo minora ovali-rotunda ad ½-bifida, segmentis acutis.

Flores monoici : ♀ in ramo innovando terminales. Bracteæ foliis subæquales subserrulatæ, lobis acutis obtusisve, inferiore duplo minore; bracteola ovali-rotunda ad ⅓ fissa.

Perianthia subemersa obconico-oblonga 4-carinata-cornutaque, carinis papulosis in ætate subobsoletis, cornibus tenuiusculis late patentibus interdum fere squarrosis longitudine variis semper tamen cætero perianthio duplo brevioribus.

Andrœcia cauligena mediocria; bracteæ sub 5-jugæ.

Cerato-Lejeuncæ Cubensis, quoad foliola parva huic similis, differt caule longiore fere in planum ramoso; foliis planioribus obliquis, vix autem dimidiatis, raro subocellatis; sed præcipue perianthii elongati cornibus sat longioribus patentibusque.

Foliola magnitudine valde varia, aliorum ramorum duplo minora, nunquam tamen magna qualia in *L. variabili*, etc.

Specimina Guianensia ex herb. Montagnei minime *rigida* sunt, post siccationem tamen difficiliter emollitura.—*L. ceratantha* M. et N., nisi pro *foliis densis*, vix diversa videretur.

5. CERATO-LEJEUNEA COMMIXTA, Spruce.

Hab. Tarapoto, in *Bryo-Lejeunea fruticosa* Tayl. repens, cum *L. plumula* Spruce mixta.

F ·55 × ·4, *lob* ·15; *c* $\frac{1}{4\cdot5}$; f^{la} ·2 × ·15; *per* ·6 × ·35^{mm}.

Rufo-badia, intricata, parum stratificata. Caules ½–1 poll. longi, in planum ramosi, arcte subbipinnati, ramis inæquilongis.

Folia subcontigua oblique ovata (vix dimidiata) obtusata rotundatave integerrima planiuscula, basi antica dilatata non autem semicordata, ocello distincto cellulis 2–6 majoribus scariosis constante; lobulus vix 4-plo brevior conspicuus ovato-quadratus inflatus subsaccatus; cellulæ *L. rigidulæ*.

Foliola vix triplo breviora ovali-rotunda ad ⅓ bifida, segmentis acutis.

Flores dioici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis subæquilongæ ultra ½ bifidæ, lobo anguste obovato-lanceolato obtuso, integerrimo, interdum apice angulato, lobulo paulo angustiore dimidio breviore lanceolato acuto; bracteola lanceolata ad ½ bifida carinata, segmentis acutatis, integerrima.

Perianthia parum emersa obovato-oblonga 4-carinata-cornutaque, carinis e cellulis extantibus pulchre pellucido-tuberculosis, cornibus perbrevibus late patentibus.

Cerato-Lejeunea plumula, mixta, foliis dimidiatis falcatis, apice acutis et argute serrulatis, facile distincta.—*C.-L. rigidula* floribus monoicis; lobulis foliolisque subminoribus, his orbiculatis; perianthia cornibus fere brevioribus erecto-patentibus, diversa est.—*C.-L. luteola* colore pallido, teneritate; caule multo minus ramoso; bracteis acutis serrulatis; bracteola ovali breviter bifida grosse serrata, differt.

6. CERATO-LEJEUNEA MONTICOLA, Spruce.

Hab. In Andium Peruviæ monte *Guayrapurina*, ad cortices vetustas.

Cum *L. Cubensi* Mont. convenit statura pusilla, foliolis parvis (=folii ¼–⅓) &c., differt florescentia dioica et caracteribus sequentibus. Caules a basi brevi prostrata suberecti cæspitosi parum ramosi. Folia angulo 60° patentia (nec divergentia) subdimidiata, margine postico recto basi recte complicata, lobulo parvo obsoletove, apice abrupte

acuta subintegerrima. Foliola ovato-rhombea ultra ½ bifida, segmentis peracutis. Bracteæ iis *L. Cubensis* multo majores, ·7mm longæ; bracteola ·6 × ·3mm. Perianthia majora, ·9 × ·6mm urceolata compressa apice late truncato rostellata, 4 carinata, brevicornia, cornibus brevi-conicis compressis, apice rotundatis, late fere horizontaliter patulis. Andrœcia sæpius terminalia brevia ovoidea, bracteis 3–5-jugis majusculis.

7. CERATO-LEJEUNEA LUTEOLA, S.

Hab. S. Carlos fl. *Negro*, in cortice vetusto: planta ♀ sola, sterilis.

F ·55 × ·4; *lob* ·1; *c* $\frac{1}{3\cdot5}$; f^{la} ·15 × ·15; *br* ·75; br^{la} ·6 × ·35mm.

Ex albido lutescens vix rufula prostrata stratificata, pellucida tenera. A *L. rigidula*, affini, differt teneritate, colore pallido, florescentia dioica, caule brevi ½-pollicari repente paulo ramoso, ramis sæpe elongatis. Folia subimbricata arcuato-concava oblique subsemicordato-ovata rotundata obtusatave repanda integerrima, superiora raro apice obsolete denticulata; lobulus parvus inflatus; cellulæ subparvulæ fere vacuæ, pariete ad angulos subincrassato; ocelli nulli. Bracteæ foliis submajores acutæ superne parce grosse serrulatæ, lobo ovali, lobulo breviore lanceolato; bracteola subovalis breviter bifida apice grosse subserrata v. fere æqualiter 4-fida, utrinque cum bracteis connata.

8. CERATO-LEJEUNEA CADUCIFOLIA, Spruce.

Hab. Manaos, supra fluminis *Negro* ostia, in cortice.

F ·42 × ·35; *lob* ·075–·15; *c* $\frac{1}{5}$; f^{la} ·1 × ·1; *br. lobus* ·5 × ·2; br^{la} ·3 × ·15; *per* ·45 × ·25mm.

Pusilla, rufescens, plagas latas densiusculas formans. Caules ½-pollicares vage ramosi implexi, ramique tenues flexuosi, e foliis deciduissimis—foliolis solis, rarius etiam lobulis, persistentibus—ex parte denudati.

Folia subhorizontalia contigua vel parum imbricata, late semicordato-oblonga, falcata, apice rotundato obtusove recurvula, margine undulato-repanda insuperque celluloso-subcrenulata, basin versus cellulis 1–3 magnis ocellata; lobulus folio 3–6-plo brevior ovatus inflatus exciso-acutus, persæpe deficiens; cellulæ fere minutulæ, iis cæterum Cerato-Lejeunearum minores, subpellucidæ. Utriculi nulli.

Foliola distantia, foliis 4–5-plo minora ovato-rotunda vel subrhombea, medio margine utrinque angulata v. raro unidentata, apice ultra medium bifida, segmentis subacutis.

Flores dioici: ♀ in ramo sæpe iteratim innovando-florifero terminales. Bracteæ foliis longiores complicato-bilobæ, lobis planis lanceolatis acutatis integerrimis, postico subminore; bracteola paulo minor oblonga vix ad ½ bifida, sinu segmentisque acutis.

Perianthia foliis caulinis subæquilonga obovata truncata brevi-rostellata 4–5-gona, *ecornia*.

Ab omnibus affinibus facile distincta!

9. CERATO-LEJEUNEA COARINA, Gottsche.

Syn. Hep. 395.

Hab. Ad rupes fluminis *Negro* cataractarum humectatas, necon ad arborum ramulos rivuli *Cauapuna* inundatos. (R. S. 1853.) Ad fl. *Coari* ostia, flum. Amazonum affluentis, legit cl. MARTIUS.

F ·65 × ·5, *lob* ·125, *c* $\frac{1}{50}$–$\frac{1}{45}$; f^{la} ·3 × ·4, ·35 × ·45, ·4 × ·55 (*in var.*); *br* ·55; br^{la} ·5 × ·45; *per* 1·0 × ·4^{mm}.

Rufo-badia late prostrato-stratificata. Caules 2–3 pollicares vage ramosi, in parte inferiore amentis ♂ sæpe pinnulati.

Folia subimbricata patula semicordato-oblonga, apice decurvo subobliquo rotundata obtusatave, integerrima, basi subrecte complicata; lobulus 5-plo brevior ovatus inflatus; cellulæ parvæ pellucidæ, parietibus fuscidulis. Utriculi nulli vel perrari.

Foliola dissita vel contigua, foliis duplo breviora (in ramis fertilibus sæpe 4-plo breviora) cordato-orbiculata, paulo latiora quam longa, ad vel paulo ultra $\frac{1}{3}$ fissa, segmentis erectis acutis.

Flores monoici: ♀ in ramo brevi terminales, innovatione simplice, raro prolifera, suffulti: rarissime e dichotomia. Bracteæ foliis minores ultra medium bifidæ, lobo oblique obovato lanceolatove subacuto, lobulo rhomboideo; bracteola ovali-orbiculata ad $\frac{1}{3}$ bifida, segmentis acutis sæpe imbricatis; omnes repandulæ integerrimæ.

Perianthia altiuscule emersa, foliis dimidio longiora, clavato-oblonga pyriformiave, supra medium 4-carinata, carinis apice vel recte truncatis vel sæpius in cornua rudimentaria horizontalia triangularia dilatatis.

Amenta ♂ crebra cauligena, folium vicinum paulo superantia; bracteæ sub 5-jugæ mediocres.

Obs. In iisdem locis advenit altera forma, *megalostipa*, foliolis folia fere æquantibus; foliis apice valde decurvo-concavis, interdum apice subdenticulatis; perianthiis apice lato recte truncatis ecornibus, vel carinis lateralibus brevissime cornutis.

In Syn. Hep. l. c. perianthia (probabiliter juvenilia) "ventricosa" descripta sunt.

10. CERATO-LEJEUNEA VARIABILIS, Lindenb. Syn. Hep. 399.

Hab. In sylva Amazonica tota, præcipue juxta fl. *Negro* ripas, in arborum truncis, ramis, foliis, necnon in radicibus inundatis, etiam in filicibus etc., in saxis et in truncis putridis rarior; in Andibus vix ad alt. 1000m. attingit.

F ·85 × ·65, ·8 × ·6; *lob* ·1–125; *c* $\frac{1}{36}$; f^{la} ·5 × ·6, ·45 × ·5; *br* ·5; *per* 1·2 × ·45; *cornua* ·25+^{mm}.

Majuscula rufo-badia, sæpe sublurida, raro nigrescens, pro more dense stratificata. Caules 1½–3-pollicares prostrati inæqualiter pinnati et subbipinnati.

Folia imbricata late semicordato-ovata, interdum ovato-oblonga, apice decurvo abrupte acuta—v. inferiora rotundata—repandula integerrima; lobulus minutus folio 6–8-plo minor inflatus; cellulæ subparvulæ æquilateræ pellucidæ, inferiores sensim majores, ocello nullo. Utriculi adsunt.

Foliola inferiora parva dissita, superiora increscentia subimbricata dimidium folium plus minus superantia, cordato-ovata, sæpius oblata, ad $\frac{1}{3}$ acute bifida, segmentis acutis.

Flores monoici: ♀ in ramo terminales, innovatione unilaterali—raro duabus oppositis—suffulti. Bracteæ foliis sat breviores profunde complicato-bifidæ denticulatæ, raro subintegerrimæ, lobis subacutis, inferiore fere duplo breviore; bracteola ovalis v. fere orbiculata ad $\frac{1}{3}$ bifida, segmentis acuminulatis, interdum serrulata.

Perianthia emersa obconica supra medium 4- (5-) carinata, carinis in cornua plus minus elongata—semper cætero perianthio breviora—subulata, obtusa acutave, plus minus patentia, stricta recurvulave, porrecta.

Andrœcia folio caulino subæquilonga v. parum longiora; bracteæ 3–5- (raro 6-) jugæ majusculæ subimbricatæ.

Ad fl. *Negro* cataractas in rupibus advenit forma caulibus elongatis parallelis, ramulis ♂ et ♀ sæpe arcte pinnulatis.

Cum eadem, necnon ad fl. *Orinoco* cataractas, legi formam *megalostipam*, foliolis folia fere æquantibus cordato-orbiculato-ovatis—vix unquam subreniformibus.—Huic valde similis est *L. cornuta* Lindenb.! in hb. Hook., e Guiana, Syn. Hep. 399, differt autem foliis ocellatis, perianthii cornibus longis perfecte erectis. "L. cornuta" ejusd.! hb. Hook., ex ins. S. Vincentis, aliena est, dioica, foliorum lobulis omnibus insigniter inflatis.

Var. *subserrata*, S.

In iisdem locis ac typus habitat. Differt foliis minoribus apice serrulatis (·55 × ·43^{mm}), lobulo sæpe ad plicam minutam redacto vel etiam obsoleto; cellulis minoribus ($\frac{1}{55}$–$\frac{1}{50}$^{mm}); bracteis magis serratis v. etiam spinulosis; perianthiis sæpe immersis.

Var. *saproxylophila*, S. A typo differt foliis apice serrulatis semper subacutis; foliolis maximis folia superficie æquantibus apice ad $\frac{1}{4}$ solum bifidis; bracteis acuminulatis inciso-serrulatis, bracteola latior quam longa spinulosa fere ad $\frac{1}{2}$-bifida, segmentis acuminulatis; perianthii cornibus fere horizontaliter patulis. A var. *subserrata* diversa iisdem caracteribus insuperque foliis cellulisque majoribus, lobulo semper distincto inflato. *Hab.* ad fl. *Uaupés* et M. *Guayrapurina*, in truncis putridis.—Primo visu species distincta videretur, quum tamen in typo, necnon in var. *subserrata*, foliola ad eandem stirpem nunc majora nunc minora inveniuntur, foliaque apice nunc argute serrata nunc fere integerrima, omnes pro unica specie valde variabili habendas censeo.—In omnibus formis frequenter adsunt utriculi magni, ad ramorum basin bini oppositi; constant folio in sacculum conchæformem reniformemve, facie supera depressum perforatumque, omnino convoluto.—In vars., magis frequentur quam in typo, flores dichotomiales inveniuntur, ramulis novellis interdum apice iterum floriferis furcatisque.

11. CERATO-LEJEUNEA RUFO-PELLUCIDA, Spruce.

Hab. Ad *San Carlos del Rio Negro*, in arborum foliis, rarius in cortice et in truncis putridis.

F ·85 × ·6, ·55 × ·5; *c* $\frac{1}{40}$; *f^{la}* ·45 × ·65, ·25 × ·3; *br* ·55; *br^{la}* ·45 × ·3; *per* ·75 × ·3^{mm} (*lat. infra cornua mensa*).

Rufa sat robusta prostrata. Caules 1–2-pollicares pinnati et inæqualiter subbipinnati, ramis omnibus planis.

Folia pulchre pellucida subimbricata subdivergentia, semicordato-ovata, falcato-dimidiata, margine postico recto vel sæpe subconcavo, apice obliquo abrupte acuta, rarius rotundata, et plus minus argute—interdum subduplo—serrulata, basi sinuato-complicata; lobulus 4–6-plo brevior semper inflatus transversus semiovatus; cellulæ

parvulæ pellucidæ, prope basin sensim multo majores sed non in ocellum congestæ. Utriculi magni ad ramorum basin sæpe adveniunt.

Foliola subimbricata dimidium folium pro more superantia—in aliis ramulis autem foliis 3-plo breviora, cordato-reniformia ad $\frac{1}{4}$–$\frac{1}{3}$ bifida, rima 8 cellulas alta, segmentis apiculato-acutis, integerrima, superiora raro denticulo uno alterove armata.

Flores monoici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis $\frac{1}{2}$ breviores bipartitæ argute serrulatæ, lobo ovali acuminulato, lobulo multo minore lanceolato; bracteola ovalis serrulata ad $\frac{1}{3}$ fissa.

Perianthia emersa obpyramidato-cylindrica longicornia, cornibus tenuiusculis cylindrico-subulatis strictis recurvulisve late patentibus.

Andrœcia crebra longispica ramulum totum, vel sæpius rami longioris apicem, tenentia; bracteæ ad 12-jugæ mediocres laxe imbricatæ.

A *L. variabili* var. *subserrata* habitu et pelluciditate primo visu diversa, ab eadem tamen ægre definienda foliis apice argute subduplo serratis, lobulo semper inflato; foliolorum segmentis apiculatis; perianthiis subcylindricis; andrœciis longispicis.—*L. Brasiliensis* G. (ad flum. Amazonum a cl. Martio lecta, a me prætervisa) differre videtur foliis subacuminatis apice spinulosis; foliolis minus profunde cordatis distincte denticulatis serrulatisve, et perianthiis latioribus. Forsan utraque pro forma ejusdem speciei habenda.

12. CERATO-LEJEUNEA FULIGINOSA, Spruce.

Hab. Ad fl. *Negro* et *Uaupés* cataractas, in arborum truncis et rupibus inundatis: semper sterilis et, ut videtur, mere mascula.

F ·75 × ·55; *lob* ·15; *c* $\frac{1}{15}$; *f*^{la} ·35 × ·35^{mm}.

Prostrata nigro-fusca, fere fuliginosa, in plagas latas tenues extensa. Caules 2-pollicares paralleli inæqualiter subpinnati.

Folia horizontalia patentia, inferiora dissita ligulato-oblonga, superiora subimbricata oblique ovato-oblonga subconcava, rotundata, oblique truncata, v. raro subacuta angulatave, basi subquadrata, margine repanda, sinuato-complicata; lobulus folio 5-plo brevior, ovatus inflatus; cellulæ subparvæ, basin et marginem posticum versus majores pallidioresque, ocello tamen nullo. Folia cujusque rami duo infima sæpe in utriculum reniformem, juxta caulem orificium lineare ovaleve mostrantem, omnino convoluta.

Foliola subdissita dimidium folium subæquantia orbiculato-ovata, inferiora minora ad $\frac{1}{2}$, superiora submajora contigua vix ultra $\frac{1}{3}$, bifida, sinu segmentisque acutis.

Var. *megalostipa*, foliolis maximis, foliis vix minoribus, late ovato-orbiculatis, basi indistincte cordatis, apice breviuscule bifidis.—Ad saxa cataractarum humectata.—Cum eadem crescit altera forma foliolis inferioribus parvis, superioribus majoribus solum $\frac{1}{2}$ folium subæquantibus.

A *L. variabili* differt colore nigrescente; floribus dioicis; foliis pro ratione longioribus, oblongis raro subovatis; foliolis ovato-orbiculatis, nunquam reniformibus, vix unquam cordatis.

L. hylophila, pro florescentia dioica nostræ similis, folia habet rufescentia, ovata; foliola profunde cordata, apice breviter bifida.

13. CERATO-LEJEUNEA HYLOPHILA, Spruce.

Hab. In sylva Amazonica haud infrequens, ad truncos vetustos et folia viva; *Pará;* lacum *Quiriquiry* fluvii *Trombetas;* ad fluvios *Negro* et *Uaupés*, &c.

(*Trombetas*). *F* ·5 × ·4; *lob* ·1–·08; *c* $\frac{1}{50}$–$\frac{1}{40}$; *f*^{la} ·35 × ·55; *br* ·65; *br*^{la} ·6 × ·4; *per* ·9 × ·3–·4; *cornua* ·3^{mm}.

(*Uaupés*). *F* ·8 × ·65, ·7 × ·65; *lob* ·1; *c* $\frac{1}{40}$; *f*^{la} ·5 × ·6, ·25 × ·2; *br* ·75; *br*^{la} ·75 × ·6; *per* 1·1 × ·6^{mm}.

Dense cæspitoso-procumbens, ex olivaceo rufescens badiave. Caules 1–1½-pollicares vage ramosi, interdum subdichotomi.

Folia subimbricata subdivergentia decurvo-concava late semiovata (fere dimidiata, haud tamen falcata) apice obliquo rotundata—ramea superiora subacuta—integerrima, exocellata, valde sinuato-complicata; lobulus parvus, folio 5–8-plo brevior, saccatus, nunquam obsoletus; cellulæ subparvæ subpellucidæ. Utriculi nulli vel perrari.

Foliola imbricata contiguave, foliis fere æquimagna—rarius 2–3-plo minora—latiora quam longa, cordato-reniformia, vel prælate cordato-ovata, basi profunde excisa, apice late rotundato ad $\frac{1}{4}$–$\frac{1}{3}$ bifida, segmentis contiguis acutis v. subobtusis, rima vix perceptibili: inferiora semper minora, superiora sensim increscentia.

Flores dioici: ♀ in ramo terminales, interdum dichotomiales, innovationibus simplicibus, vel altera iterum prolifero-dichotoma. Bracteæ foliis sublongiores suberectæ complicato-bipartitæ apiculato-acutæ—raro altera obtusa—subserrulatæ, lobis lanceolatis, æquilongis, vel inferiore breviore semperque angustiore; bracteola ovalis vel fere rotunda, ad $\frac{1}{5}$–$\frac{1}{3}$ bifida, serrulata, segmentis apiculato-acutis.

Perianthia foliis fere duplo longiora, obconico-cylindracea, 4–5-carinata, carinis papulosis in cornua sat elongata, pungentia vel subobtusa, erecta vel erecto-patentia protractis.

Amenta ♂ cauligena, folium contiguum subsuperantia; bracteæ sub 4- (raro ad 8-) jugæ majusculæ galeiformes, apice subrostratæ bifidæque.

Var. *subdenticulata*, foliis apice subacutis integerrimis v. rarius 2–3-denticulatis; foliolis subminoribus semper autem cordatis, perianthii cornibus interdum magis patentibus.—S. Carlos et S. Gabriel, in arborum foliis; Obidos et Panuré, in truncis.

Probabiliter inter "*L. variabilis*" formas a cl. auct. Synopseos Hep. inclusa, certe tamen diversa floresc. dioica, &c. *L. cornuta* Lindenb ! e specim. ab ipso, monoica est, ideoque aliena.

14. CERATO-LEJEUNEA MICRORHEGMA, Spruce. (TAB. VIII.)

Hab. In sylva *Canelos*, e ramulis pendula, alt. 1000m.

F ·8 × ·65, ·7 × ·6; *lob* ·08–·1; *c* $\frac{1}{35}$–$\frac{1}{45}$; *f*^{la} ·95 × ·6, ·75 × ·5; *br. lob* ·75 × ·45; *br*^{la} ·6 × ·4; *per* 1·0 × ·4 (*lat. infra cornua*)^{mm}.

Elata, rufo-fusca nigricansve, flaccida. Caules 2–3-pollicares, fere nigri, paulo ramosi, ramis sæpe brevibus.

Folia subimbricata patentissima subfalcata, late oblique oblonga v. ovato-oblonga, basi truncato-semicordata, apice valide decurvo rotundato serrulata, decurrenti-lobulata; lobulus minutus plus minus tur-

gidus; cellulæ parvulæ pellucidæ, inferiores sensim submajores, ocello nullo. Utriculi adsunt.

Foliola foliis æquimagna, oblata tamen, insigniter cordato-reniformia, sinu baseos profundo, apice *emarginato-bidentula*, sinu solum 4 cellulas alto, angusto, dentibus cellula unica apiculatis, e margine toto incurvo *concava*.

Flores dioici: ♀ in ramo brevissimo terminales, innovatione simplice suffulti. Bracteæ foliis subæquilongæ suberectæ profunde complicato-bilobæ, spinulosæ, lobo obovato-lanceolato acuto, lobulo 2–3-plo breviore oblongo obtuso; bracteola utrinque subconnata ovalis brevissime bifidula, basi breviter constricta quasi-stipitata.

Perianthia emersa oblonga 4-5-gona longicornia; cornibus cætero perianthio vix brevioribus suberectis angustiusculis.

E foliolis concavis—nec convexis—apice fere integris, a plurimis *Cerato-Lejeuneis* aberrat, *L. hylophilæ* et *L. variabili* var. *saproxylophilæ* proxima.

15. CERATO-LEJEUNEA MARITIMA, Spruce.

Hab. Caripi, prope fluvii *Pará* ostia, in rupibus maritimis, rarius in truncis vetustis vicinis, plagas maximas densas efficiens. Planta mascula solum visa.

F ·65 × ·45; *lob* ·1; *c* $\frac{1}{40}$; *f*[a] ·35 × ·5, ·3 × ·55, ·25 × 25, ·15 × ·15[mm].

Rufo-badia, *L. hylophilæ* subsimilis, diversa ut videretur caracteribus sequentibus. *Folia* semiovato-oblonga, obliqua sed vix dimidiata, obtusa, raro subacuta, apice serrulata v. saltem angulata; *lobulo* parvo ovato, aliorum ramorum subgloboso turgidiore, rarissime obsoleto. *Utriculi* proprii nulli. *Foliola* foliis sub 2-plo minora, superiora sæpe fere duplo latiora quam longa, breviter bifida, segmentis acuminulatis, *basi rotundata nec profunde cordata* (qualia in *L. hylophila*). In aliis ramis—vel etiam in ejusdem rami apice elongato—aliquando adveniunt foliola longe minora, orbiculata, rima paulo profundiore. *Andræcia* crebra longispica, sat robusta, bracteis circiter 10-jugis.

Cerato-L. platyceras certe distincta erit foliis acuminatis magis serratis, *foliolis profunde bifidis* nunquam reniformibus.

Densely-stratified to the depth of half an inch, or even an inch, and absorbing moisture like a sponge.

16. CERATO-LEJEUNEA PLATYCERAS, Spruce.

Hab. In valle fl. *Pastasa* infra *Baños*, alt. 1500[m]., ad ramulos cum *Frullaniis*, pl. ♂; in sylva *Canelos*, in cortice, pl. ♀ sterilis.

F ·9 × ·65, ·7 × ·55; *lob* ·15–·1; *c* $\frac{1}{40}$; *f*[a] ·3 × ·3, ·25 × ·3, ·2 × ·25; *br* ·9 × ·55; *br*[a] ·65 × ·45; *per* 1·0 × ·45 (× ·75[mm] *cornibus inclusis*).

Robusta rufa prostrata. Caules 1½–2-pollicares pinnati, flexuosi intricati, ramis brevibus inæqualibus.

Folia subimbricata patentia late dimidiato-ovata, subsemicordata, apice decurvo subacuminata vel solum acuta, margine postico recto supra medium, antico fere toto apiceque, argute dentato-serrata-spinulosave, subrecte complicata; lobulus minutus folio 6–7-plo brevior inflatus, aliorum ramorum major saccatus et ad folia infima interdum in

utriculum majusculum dilatatus; cellulæ parvulæ pellucidæ, 2v. plures cæteris duplo majores juxta folii basin in lineam occellumve congestæ.

Foliola dissita foliis 2–3-plo, in pl. ♀ sæpe 4-plo minora, suboblato-orbiculata, *adusque v. paulo ultra* ½ *bifida*, segmentis acuminulato-acutis, sinu lato acuto, margine supra medium pauciserrulato raro integerrimo.

Flores dioici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis æquilongæ bipartitæ, lobis lanceolatis acutis, crebre spinuloso-serratis, inferiore duplo angustiore et subbreviore; bracteola minor ovali-lanceolata fere ad ½ bifida, serrulata, segmentis acuminulatis, basi utrinque cum bracteis connata.

Perianthia subemersa urniformia subcompressa alte 4-carinata, carinis papulosis apice in cornua lata brevia recurvulo-patula—rarissime clausa oblonga compressa—plerumque plus minus evoluta, obconica, ore hiante inæqualiter lobulata crenatave, dilatatis.

Andrœcia in ramis terminalia, vel ramulum totum tenentia, robusta; bracteæ 5-jugæ, foliis 2-plo breviores, imbricatæ turgidæ.

L. Filaria Tayl., ad *Esmeralda* a cl. JAMESON lecta, quoad folia valide dentato-serrata et foliorum segmenta acuminata nostræ similis, differt foliis "rotundis obtusis."

L. Brasiliensis Gottsche, Syn. Hep. 398, facie et foliolis subserratis nostræ similis, certe distincta est foliis solum apicem versus serrato-spinulosis; foliolis magnis ad ⅓ solum bifidis, et perianthiis longicornibus.

L. platyceras, quoad caules pinnatos et folia argute serrata *L. plumulæ* haud dissimilis, differt floribus dioicis; lobulis plerisque inflatis (parvis tamen); foliolis multo majoribus subserratis; perianthii cornibus patulis plerumque evolutis, etc.

Obs. Utricles—not very large—are present at the base of a few of the branches, but their place seems to be mostly supplied by several (rarely all) of the leaf-lobules on certain branches becoming more turgid, although not longer, than in the normal state. Any tenants these sacs may have contained have disappeared from my specimens.

17. CERATO-LEJEUNEA SPINOSA, Gottsche.

G. L. et N. Syn. Hep. 402.

Hab. in M. *Chimborazo*, alt. 1500^{m}, in arborum truncis et e ramulis pendula, sociis *Taxi-Lejeuneis*, *Plagiochila bursata*, etc. In insulis Antillis primum inventa fuit.

F 1·35 × ·8; *lob* ·15; *c* $\frac{1}{3\cdot5}$; *f*^{la} ·6 × ·45; *br. lob* 1·0 × ·5; *br*^{la} ·85 × ·4^{mm}.

Rufa, fragilis, aliis muscis arcte adhærens. Caules 3–4-pollicares, subflexuosi, parce ramosi v. fere simplices.

Folia subimbricata patentia, obliqua v. subdimidiata, semicordato-ovata acuminata acuta, margine antico 1–2-dentata, postico spinuloso-dentata-serratave, dentibus inæqualibus, apicali prælongo subulato, basi minute sinuato-lobulata, lobulo folio 9-plo breviore saccato compresso-obconico margine transverso inflexo obscure denticulato; cellulæ subæquilateræ subparvulæ pellucidæ, versus folii basin posticam duplo majores, versus marginem anticum multo minores.—Lobulus foliorum rameorum e lobi majoris ratione caulinis major, duo infimi sæpe magni involuto-inflati dimidium folium tenentes.

Foliola subdistantia foliis duplo breviora ovata ultra $\frac{1}{2}$ bifida, segmentis tenui-acuminatis, margine recurvulo integerrima.

Flores dioici: ♀ in ramulis breviusculis terminales, innovatione simplice suffulti. Bracteæ foliis breviores bipartitæ, lobo ovato-lanceolato acuminato ciliato-spinoso, lobulo subbreviore multo angustiore lanceolato acuminato, (vel altero truncato-bispinoso) subintegerrimo; bracteola ovata profunde bifida, segmentis longissime acuminatis, integerrima.

Perianthia haud vidi, sec. cl. Gottsche l.c. sunt clavato-urnæformia 4-cornia, cornibus magnis latis compressis.

SUBGENUS XXV.—*TAXI-LEJEUNEA*, S.

Omphalanthus N. et Ldng. Syn. Hep. ex p.; *Lejeunea* Mont., Syn. Hep. ex p.

Plantæ grandiusculæ, strato tenui late repentes, albido-virides—nunquam rufulæ fuscæve—laxe textæ pellucidæ. Caules tenues flaccidi laxe pinnati subsimplicesve, primum repentes dein sæpe penduli apiceque indefinite evoluti; rami ♀ parvi-paucifolii iteratim innovandi, floribus secundis confertis onusti.

Folia laxe imbricata contiguave, majuscula vel magna, in Codonocoleis circiter 1·2 (·9–1·6)^{mm}, in Pyramidocoleis ·8 (·6–1·1)^{mm} longa, tenera subplana, plus minus ovato-triangularia, pro more acuta subacuminatave, in paucis rotundata, apice serrata integerrimave, lobulo basali minuto vel sæpissime nullo; cellulæ mediocres ($\frac{1}{36}$–$\frac{1}{24}$^{mm}) vel etiam majusculæ ($\frac{1}{20}$–$\frac{1}{16}$^{mm}), leptodermes, endochromio parco pellucidæ, planæ vel marginales convexæ.

Foliola mediocria, magna, vel etiam maxima—vix unquam parvula—in paucis folio æquimagna vel imo submajora—integerrima vel solum celluloso-crenulata, breviter, raro ultra medium, bifida, rarissime integra.

Flores omnium fere monoici*: ♀ ad ramulos innovatos terminales, quasi-seriati; bracteæ pro more parvæ lanceolatæ sæpissime denticulatæ, lobulo parvo nullove; bracteola ovalis bifida bidentatave raro integra.

Perianthia pro more parva pellucida obconica vel obpyramidata, angusta, vix compressula, vel omnino ecarinata vel apice solo—vel denique fere a basi—5-carinata, plerumque rostellata, lævia vel ad carinarum apicem cristulata.

Amenta ♂ lateralia, folio caulino breviora, sæpe minuta, tenuia, oligophylla, incurva. Rarissime adveniunt amenta longiora in ramis terminalia.

In sectiones duas dividenda est Taxi-Lejeunea, sc.

1. *Codonocolea*, perianthiis parvis tenerrimis obconicis et, vel omnino ecarinatis inermibusque, vel ipso apice carinas 5 (sæpe cristatas) ostendentibus.—Folia magna sæpius apice serrata; cellulæ interdum majusculæ, ad $\frac{1}{16}$^{mm} longæ. Foliola sæpe maxima, ipsis foliis submajora, aliarum

* *Taxi-Lejeuneæ* omnes, quarum fructus adhuc cognovimus, monoicæ sunt. In perpaucis speciebus, cum *Pyramidocoleis* ex habitu simili hic collocatis, flores alterius sexûs et perianthia ignota remanent.

specierum autem sat minora; fere semper oblata, reniformia, basi profunde cordata, apice levissime emarginata, raro profundius fissa, rarissime integra.

2. *Pyramidocolea*, perianthiis majoribus, foliis caulinis subæquilongis, fere a basi, vel saltem supra medium 5-angulatis-carinatisve, angulis vel lævissimis vel solum papulosis—nunquam cristatis.—Folia mediocria majusculave, apice integerrima rarius subserrata. Foliola foliis 2–3-plo minora, basi vel rotundata vel subcordata, apice ad $\frac{1}{3}$–$\frac{1}{2}$ (raro brevius) bifida.

Hab. Codonocoleæ (*Omphalanthi* 'Syn. Hep.' ex p., valde diversæ autem ab *O. filiformi*, quem pro subgeneris *Omphalo-Lejeuneæ* typo habui) ad arborum ramulos et folia viva, necnon ad filices, raro in cortice, montes tropicales sylvaticos ad alt. 2000^{mm} usque habitant, in planitie rarissimæ. *Pyramidocoleæ* (*Lejeuneæ Acutifoliæ* 'Syn. Hep.' ex p.) in truncis vetustis, sæpe aliis hepaticis et muscis consociatæ, raro in ramulis, foliis, vel filicibus, interdum in saxis vel in ipsa terra, vigent; planitiem sylvaticam et montes inferiores amant, paucæ alt. 2000^{m} superantes.

Distr. Codonocoleæ sub 16 adhuc descriptæ omnes neotropicæ videntur nisi *L. umbilicata* Nees, e Java, et *L. gracilipes* Tayl., ex ins. Oceanicis. In Andibus Quitensibus 4 species legi (*T. L. Chimborazensis*, nova) quarum *T. L. sulphurea* L. et L. etiam in planitie ad fluvios Bombonasa et Negro crescit: in ins. Antillis vulgata videtur. *Pyramidocolearum* species in libris definitæ sub 10, omnes (*L. lumbricoides* N., Javanica, excepta) neotropicæ, pleræque Mexicanæ et Columbianæ, inter quas nominare liceat (haud sine dubio, ob speciminum defectum) *L. acutangula* N., *L. Caraccensis* Lindng., *L. Beyrichii* Lndng., *L. Gottscheana* Lndng., *L. assimilis* L. et G., *L. tenera* Sw! Ipse in terris Amazonicis et Andinis 9 species legi, omnes (ut videtur) novas, alias autem probabiliter cum *Lejeuneis* jam (incomplete?) descriptis confusas.

§ 1. CODONOCOLEA.

A. *Per. apice ipso pentagona, angulis spinosis cristulatisve.*

1. *T.-L. Chimborazensis.* F. semicordato-ovata apiculata apicem versus spinulosa, laxe reticulata, lobulo 0. Foliola foliis fere duplo breviora cordato-ovato-rotunda, inferiora integra, superiora apice rima sub 5 cell. alta bidentula. Perianthia cylindrico-campanulata superne obtuse 5-gona, angulis apice bispinosis.
2. *T.-L. pterogonia.* F. ovato-triangularia subapiculata apice subserrulata, minutissime lobulata. Foliola foliis æquimagna orbiculata profunde cordata, auriculis forficatis, apice ad $\frac{1}{5}$–$\frac{1}{4}$ bifida. Per. longe infundibulata teretia, apice pentagona, angulis laciniato-alatis.

B. *Per. ecarinata ecristataque, apice corrugato-inflexa.*

a. *Foliola apice bidentula.*

3. *T.-L. sulphurea.* F. semicordato-triangularia apiculata, supra medium celluloso-crenulata, subelobulata. Foliola foliis $\frac{1}{4}$ breviora cordato-orbiculata undulata, dentibus apicis 5c. altis. Br. serrulatæ; bracteola obovata ad $\frac{1}{4}$ bifida. Per. obconico-clavata lævia.—Var.? *pusilla.* F. acuminulata subcrenulata, apice subserrulata. Foliola foliis fere duplo breviora cordato-subreniformia, latiora quam longa.
4. *T.-L. renistipula.* F. magna subdivergentia ovato-triangularia subacuminata crenulata, apice dentato-serrata, margine postico crispata,

minute lobulata, laxe texta. Foliola foliis imo majora cordato-reniformia, dentibus apicis 4–5c. altis. Br. perianthiaque fere *T. L. sulphureæ*.

b. *Foliola ad ½ bifida.*

[*T.-L. leioscypha*, G. F. late ovata abrupte apiculata integerrima parvilobulata. Foliola vix minora profunde cordato-orbiculata, laciniis apicis erecto-forficatis. Br. minutæ liberæ. Per. minuta obconica reticulata, apice depresso plicatula.—*Mexico.*]

[*T.-L.? umbilicata*, N. F. late semicordato-ovato-oblonga fornicata, apice decurvo rotundata, lobulo 4-plo breviore, cellulis parvulis. Foliola minora cordato-reniformia, laciniis patulis. Br. foliis parum minores vix complicatæ, cum bracteola altiuscule connatæ. Per. longe pyriformi-obconica subcompresso-teretia, apice depresso vix corrugato minute mammillata.—Anne melius inter *Hygro-Lejeuneas* collocanda? —*Java.*]

§ 2. PYRAMIDOCOLEA.

A. *Monoicæ.*

a. *Foliola brevissime bifida.*

5. *Taxi-L. dictyocalyx.* F. acuminulata integerrima subelobulata. Foliola 2–3-plo minora, latiora quam longa, basi profunde cordata, apice ad ⅕–¼ bifida. Br. subserratæ. Per. subemersa clavato-oblonga alte 5-carinata pulchre reticulata.

b. *Foliola ad ⅓–½ usque (raro ultra) bifida.*

* *Folia obtusata rotundatave bracteæque integerrima.*

6. *Taxi-L. crebriflora.* F. subcontigua oblique subfalcato-oblonga subelobulata. *Fᵘᵃ* 3–4-plo breviora ad vel paulo ultra ½ bifida. Br. lanceolatæ obtusatæ elobulatæ; bracteola late ligulata breviter bifida. Per. obpyramidato-clavata supra medium 5-carinata, carinis subpapulosis apice lato truncato-rotundatis.—Var. *arenicola*, aliis foliis subobovatis; bracteola ovali ad ¼ bifida.—Var. *minutiflora*, br. tam ♀ quam ♂ minutis; bracteola ♀ cuneato-oblonga ad ⅓ bifida.

7. *Taxi-L. tenax.* Caules sat robusti tenaces. F. magna tortilia semicordato-ovata (raro subacuta); lobulus 5–6-plo brevior inflatus. Foliola plus 3-plo breviora suborbiculata ad ½ bifida, segmentis acutis obtusisve. Br. foliis duplo minores.

[*Taxi-L. tenera* Sw. ! Tota planta tenera fragilis. F. magna plana late oblique ovata, lobulo obsoleto. Foliola plus 2-plo breviora, segmentis acutis. Br. foliis multoties minores.—*Jamaica.*]

** *Folia, præcipueque bracteæ, acuta acuminatave, apice persæpe subserrulata.*

8. *Taxi-L. macrorhyncha.* Caules decompositi. F. abrupte acuta raro rotundata, integerrima v. solum celluloso-subcrenulata, elobulata. Foliola 4-plo breviora paulo ultra ½ bifida. Br. integerrimæ, lobulo parvo vel 0; bracteola lanceolata ad ⅙ bifida. Per. emersa pyriformia longirostria.

9. *Taxi-L. obtusangula.* Parce ramosa. F. prælate semicordato-ovata acuta, apice raro subdenticulata, lobulo 5-plo breviore inflato. Foliola ½ folio majora cordato-orbiculata ultra ⅓ bifida. Br. sub-

denticulatæ, lobulatæ; bracteola obovata ad $\frac{1}{3}$ bifida. Per. clavato-oblonga rotundata apicem versus 5-gona demum fere lævia.

10. *Taxi-L. floridu.* Pinnatim ramosa floribunda. F. subimbricata patentia late ovata subabrupte acuminulata integerrima, lobulo obsoleto. Foliola 2-plo minora ovato-orbiculata fere ad $\frac{1}{2}$ bifida. Br. integerrimæ elobulatæ; bracteola obovata, emarginato-bifida. Per. obovato-obconica, superne acute 5-carinata.

11. *Taxi-L. asthenica.* Elongata pinnatim ramosa. F. tenuia late semicordato-ovato-triangularia acuminulata, apice v. acuta v. argute 3-dentata, lobulo obsoleto. Foliola sub 3-plo breviora late orbiculata ultra $\frac{1}{2}$ bifida. Br. foliis breviores serrulatæ spinulosæve lobulatæ (vel non); bracteola oblonga ad $\frac{1}{3}$ bifida. Per. clavato-oblonga alte 5-carinata.

12. *Taxi-L. Bombonasensis.* Elongata bipinnata. F. tenera vix contigua late semicordato-ovata, alia subacuminata, alia obtusa, integerrima, lobulo obsoleto. Foliola foliis plus duplo minora orbiculata ultra $\frac{1}{2}$ bifida. Br. foliis breviores angulatæ minute lobulatæ, antice subconnatæ; bracteola obovato-lanceolata ad $\frac{1}{2}$ bifida. Per. clavato-pyriformia retusula supra medium 5-carinata.

13. *Taxi-L. implexa.* Elongata vage decomposita. F. subimbricata late semicordato-ovata subacuta, integerrima vel apice angulato-denticulata, lobulo ad plicam minutam (raro subinflatam) redacto. Foliola 2–3-plo minora paulo latiora quam longa ad $\frac{1}{2}$ bifida. Br. foliis sublongiores anguste lobulatæ subdenticulatæ; bracteola oblonga ad $\frac{1}{3}$ bifida sæpe utrinque 1-dentata. Per. clavato-oblonga supra medium 5-carinata, carinis apice rotundo-prominulis.

—Var.? *calliandra.* F. sæpe latiora magis imbricata. Foliola paulo ultra $\frac{1}{3}$ fissa. Br. grosse serratæ. Per. fere a basi carinata, carinis superne compressis alæformibus subpapulosis. Andr. sæpe prælonga, br. 20-jugis.

—Var.? *retiflora.* F. magna rotundata v. superiora obtusa (nunquam acuta), lobulo minutissimo. Foliola fere 3-plo minora fere ad $\frac{1}{2}$ bifida. Br. foliis breviores subdenticulatæ. Per. breviuscula obconica reticulato-pellucida altiuscule 5-carinata, carinis apice prominulis.

B. *Dioicæ* (speciebus monoicis haud certe affines).

14. *Taxi-L.? Tapajosensis.* Albicans elongata subpinnata. F. apice rotundata subintegerrima, marginata, lobulo 7-plo minore plano. Foliola 2-plo breviora elliptico-orbiculata fere ad $\frac{2}{4}$ bifida. Br. foliis minores integerrimæ, lobulo majusculo; bracteola oblonga ad $\frac{1}{4}$ bifida.

15. *Taxi-L.? Paraensis.* Subpinnata. F. flaccida semicordato-ovata acuta erosula, lobulo 8-plo breviore subinflato, c. pariete incrassato. Foliola $2\frac{1}{2}$-plo minora oblato-orbiculata ad $\frac{1}{2}$ bifida. Br. andrœcii paucijugæ.

1. TAXI-LEJEUNEA CHIMBORAZENSIS, Spruce.

Hab. In montis *Chimborazo* sylvaticis, ad filices, alt. 1500^{m}.

F 1·5 × 1·0; f^{la} ·95 × ·85, ·85 × ·75; *c. mediæ* $\frac{1}{15}$, *basales* $\frac{1}{12}$, *marginem anticum versus* $\frac{1}{36}$; *br* ·9 × ·3; *per* ·8 × ·3^{mm}.

Pallide viridis, siccando flavicans, prostrata et ultra matricem in tegeticulam horizontalem pendulamve protensa. Caules 2–3-pollicares

arcte pinnati validiusculi, apice indefinite prolongati, alii ramulis floriferis (tam ♂ quam ♀) crebris bipinnati.

Folia paululum imbricata plana, basi longitudinali decurrente inserta, semicordato-ovata, subtriangularia, apiculato-acuta—superiora rameaque plus minus acuminata—apicem versus subspinuloso-denticulata, dentibus 3–9 (raro 0), tenuia pellucida, basi elobulata; cellulæ leptodermes fere vacuæ subelongatæ, mediæ majusculæ, mediam basin versus magnæ, submarginales sensim minores.

Foliola contigua vel parum imbricata, dimidium folium paulo superantia, cordato-rotunda-ovatave, inferiora apice rotundata *integra*, superiora caulina acuta sæpeque minutissime bidentula, rima solum 5 cellulas alta; ramulorum fertilium autem duplo minora apiceque distincte breviter bifida.

Flores monoici: ♀ crebi, 3–6 ad quemque ramum seriatim secundi, quasi laterales, revera terminales, cymosi, ramo iteratim innovando (monotropo) insidentes. Bracteæ foliis plus dimidio breviores lanceolatæ ligulatæve acuminatæ subintegerrimæ, sæpe basi antica connatæ; bracteola tamen libera late ligulata ad $\frac{1}{3}$ bifida, segmentis acuminulatis.

Perianthia parva subimmersa cylindrico-campanulata, triplo fere longiora quam lata, inferne teretia, superne obtuse pentagona, angulis apice bispinosis (spinis rectis vel varie curvis), perianthii ipsius apice truncato, depresso vel parum elevato, demum trifido vel irregulariter rupto.

Amenta ♂ minutissima scorpioidea, folio caulino collaterali multoties breviora; bracteæ sub 6-jugæ orbiculatæ concavæ, apice bilobæ, antheridiis binatis.

Lejeunea debilis Mont.! (*Omphalanthus d.* L. et Lg.), e specimine authentico in herb. Hook., certe distincta, caule flaccido; foliis lobulo distincto parvo inflato auctis, apice solum angulatis vel paucidentatis; foliolis foliis vix minoribus (æquilatis sed perpaulo brevoribus), apice ad $\frac{1}{4}$ usque fissis.

2. TAXI-LEJEUNEA PTEROGONIA L. et L.

Jungermania pterogonia L. et L. in Lehm. nov. etc. pugill. VI. 1834. p. 44. Syn. Hep. p. 306.

Hab. Andes Peruvianos in M. *Campana*, Quitenses ad fl. *Pastasa* (alt. 1400^{m}); utrobique e ramis pendula. Antea in Mexico et Peruvia inventa est; vidi etiam specimina ad *Caldas* Brasiliæ a cl. G. A. Lindberg lecta.

F 1·1 × 1·0, *c* $\frac{1}{30}$–$\frac{1}{25}$; *f*^{la} 1·1 × 1·1, 1·0 × 1·0; *br* ·7 × ·3; *per* ·9 × ·35^{mm}.

Elata albo-viridis tenui strato repens dein dependens. Caules 6-pollicares, interrupte pinnati vel subsimplices, flexuosi, ramis pro more brevibus.

Folia subimbricata prælate ovata vel ovato-triangularia acuta apiculatave, apicem versus pauciserrulata (dentibus sub 4), basi antica late semicordata (auricula rotundo-circinata), postica minutissime lobulata; cellulæ mediæ mediocres, basin posticam versus majores, submarginales multo minores, omnes leptodermes subplanæ.

Foliola foliis æquimagna orbiculata, basi profundissime cordata, auriculis rotundis forficato-imbricatis, apice rima perangusta subobtusa ad $\frac{1}{5}$–$\frac{1}{4}$ alt. fissa, segmentis acutis.

Flores monoici: ♀ in ramulis microphyllis, simplicibus vel pinnulatis, seriatim secundi quasi-laterales. Bracteæ foliis caulinis sat minores, forma variæ, oblongæ vel ovato-lanceolatæ superne plus minus serratæ; bracteola oblonga ad $\frac{1}{3}$ bifida pauciserrulata.

Perianthia folio caulino breviora tubiformia vel anguste infundibuliformia, inferne teretia, apice pentagona, angulis alatis, alis apice in cornua laciniato-ciliatove-cristata porrectis. Sectio perianthii juvenilis transversa media subovalis, distincte obtuse pentagona.

Obs. The leaves and underleaves on the fertile branchlets are only one-third the size of those on the stem, but of similar form, and there is only a single row of them below the flower on each innovation.

3. TAXI-LEJEUNEA SULPHUREA, L. et L.

Jungermania sulphurea Lehm. et L. in Lehm. nov. etc. Pug. V. (1833) p. 14. *Lejeunea s.* Syn. Hep. 307.

Hab. Ad pedem Andium Quitensium secus fl. *Bombonasa*, in ramulis supra muscos repens, etiam ad folia viva.

F 1·0 × ·9–·8, *c* $\frac{1}{24}$; *f*^{la} ·7 × ·7; *br* ·8 × ·3; *per* 1·0 × ·55, ·9 × ·65^{mm}.

Pallide viridis, siccando interdum flavicans, prostrata pendulaque, tenuis flaccida pellucida. Caules 3-pollicares intricati subpinnati, ramis brevibus sæpe fœmineis.

Folia subimbricata, basi lata longitudinali inserta, semicordato-ovato-triangularia, rotundata vel ex obtuso apiculata, medio supero celluloso-crenulata-serrulatave, apice distincte serrulata, dentibus inæqualibus sub 7, basi postica minutissime inflexa, vel non; cellulæ majusculæ æquilateræ vel suboblongæ leptodermes, basin versus sensim laxiores, marginales superiores prominulæ.

Foliola foliis $\frac{1}{4}$ breviora subimbricata, raro subdissita, cordato-orbiculata undulata, rimâ brevissimâ 5 cellulas solum altâ apice bidentula, dentibus contiguis forficatisve acutis.

Flores monoici: Rami ♀ breves parvifolii innovando-pauciflori. Bracteæ foliis $\frac{1}{3}$ breviores lanceolatæ acutæ serrulatæ elobulatæ, vel altera parvilobulata; bracteola obovata repanda serrulatave apice bidentata, raro integra.

Perianthia foliis caulinis vix breviora, (duplo fere longiora quam lata) obconico-campanulata—rarius clavata vel subcylindrica—eplicata, apice dilatato corrugato-inflexa demum lacero-lobulata. Capsula parva globosa.

Amenta ♂ ad caulem, raro etiam ad ramos, foliis obtecta iisdemque multo breviora, decurvo-circinata; bracteæ minutæ 3–5-jugæ.

Obs. In plagulæ ambitu rami arcte bipinnati parvifolii, florescentiis crebris, masculis præcipue, onusti interdum videntur. In talibus ramis folia multo minora angustiora subacuminata et validius dentata sunt, ita ut, si non e caule typice folioso plane orta fuissent, ad speciem alienam pertinere viderentur.

Var. *subintegristipula*, minor, ditissime florifera, floribus ♀ sæpe in caulis ipsius apice innovando terminales, interdum fl. ♂ mixtis vel alternantibus; foliis subabrupte acuminulatis; foliolis paulo latioribus quam longis, aliis perfecte integris, aliis rima 4 cell. alta bidentulis.—Ad fl. *Negro* cataractas, in cortice, cum aliis *Lejeuneis*.

4. TAXI-LEJEUNEA RENISTIPULA, Lindenb.
G. L. et N. Syn. Hep., 308.

Hab. In sylva *Canclos*, ad ramulos.

F 1·6 × 1·25; *lob* .08; *c. med.* $\frac{1}{16}$–$\frac{1}{20}$, *marg.* $\frac{1}{48}$; f^{la} 1·2 × 1·4, 1·25 × 1·6; *br* 1·2 × ·4, ·8 × ·35; br^{la} 1·0 × 6, ·8 × ·5; *per* 1·1 × ·45^{mm}.

Pallide viridis pellucida tenuis, majuscula. Caules 3–6-pollicares, stratificati, vage vel pinnatim divisi, ramis sæpe innovando-floribundis.

Folia caulina magna (ramorum, præcipue fertilium, duplo minora) ad $\frac{1}{3}$ imbricata, longitudinaliter inserta, patulo-divergentia, planissima, suboblique ovato-triangularia acuta vel subacuminata, apice dentato-serrata, dentibus 3–5, toto margine celluloso-crenulata, basi antica semicordata, margine postico a basi ad medium usque crispata et subincurva (rugis sub 3), basi ipsa minutissime complicata, plica folio 20-plo breviori subquadrata plana; cellulæ majusculæ pellucidæ subæquilateræ, marginales mediis triplo minores pulchre prominulæ.

Foliola imbricata magna, foliis etiam majora, paulo oblata, cordato-orbiculata reniformiave, subplana, auriculis baseos tamen medio uniplicatis, apice rotundato subretusove minutissime *bidentula*, rimâ solum 4–5 cellulas altâ, dentibus conniventibus, margine toto pulchre celluloso-crenulata.

Flores *monoici*: ♀ in ramis iteratim proliferis seriati, assurgenti-secundi *conferti* (ad 5–6 cujusque rami); bracteæ erectæ foliis caulinis subduplo minores, variabiles tamen, alterâque duorum semper breviore, anguste lanceolatæ subacuminatæ supra medium subserratæ, a basi ad $\frac{1}{4}$ alt. anguste complicatæ, plicâ lineari acutâ; bracteola obovata ad $\frac{1}{4}$ (vel vix) bifida, segmentis acutis, apice dentato-serrata integerrimave.

Perianthia subemersa albida tenera *clavata*, *teretia*, apice rotundato subcorrugata, $2\frac{1}{2}$-plo longiora quam lata, demum clavato-campanulata, apice rupta plurifida, segmentis inflexis vel sæpe deciduis.

Androecia ad caulem, folio longe breviora, ovoidea, bracteis arcte imbricatis mediocribus cymbiformibus.

Melius pro *Taxi-L. sulphureæ* varietate crispifolia grandistipula, quam pro specie propria habenda.

5. TAXI-LEJEUNEA DICTYOCALYX, Spruce.

Hab. Tunguragua, in arborum vetustarum cortice, alt. 2300^{m}.

F 1·1 × ·9; 1·0 × ·75, *lob* ·1, *c* $\frac{1}{28}$; f^{la} ·55 × ·65, ·4 × ·5; *br* ·85 × ·4; br^{la} ·8 × ·6, *per* 1·0 × ·45^{mm}.

Pallide viridis flaccida, strato tenui effusa. Caules pollicares parum divisi subpinnati.

Folia paulo (ad $\frac{1}{4}$) imbricata, angulo 70° adscendentia, e basi longitudinali, late semicordato-ovata subabrupte acuminulata acuta, acumine breviusculo vel foliorum superiorum longiore decurvulo, integerrima, basi anticâ caulem late transeuntia, posticâ angustissime inflexo-complicata (vel vix); cellulæ mediocres pellucidæ fere vacuæ.

Foliola dissita, foliis 2-plo (inferiora sub 3-plo) minora, profunde cordata, oblato-ovata vel suborbiculata, apice rima brevi (ad $\frac{1}{5}$–$\frac{1}{4}$ alt.) fissa, segmentis apiculato-acutis conniventibus, alis recurvis.

Flores monoici: ♀ terminales, cum innovatione simplice, raro in ramo prolifero seriati. Bracteæ erectæ foliis subbreviores lanceolatæ acuminulatæ subserratæ vel fere integerrimæ, ad medium bifidæ, lobulo perangusto apice lanceolato; bracteola late oblonga rotundata brevissime (raro ad $\frac{1}{6}$ usque) bifida, apicibus acutis.

Perianthia foliis caulinis subæquilonga clavato-oblonga rotundato-truncata brevi-rostellata, fere a basi alte 5-carinata—paulo compressa, pellucida reticulata lævissima.

Amenta ♂ folio caulino duplo breviora, incurva; bracteæ sub 5-jugæ minutæ pallidæ.

Taxi-L. obtusangula, huic habitu persimilis, differt foliis subminoribus, solum acutis (nec acuminatis) distincte lobulatis; foliolis magis profunde (ultra $\frac{1}{3}$) et valde obtuse bifidis; perianthiis minus alte carinatis supra medium constrictis.

Taxi-L. florida, foliis minoribus vix semicordatis; foliolis minime profunde cordatis, apice *fere ad medium bifidis*; bracteis integerrimis et perianthii carinis papulosis differt.

6. TAXI-LEJEUNEA CREBRIFLORA, Spruce.

Hab. S. Gabriel fluvii *Negro*, in arborum foliis.

F 1·0 × ·75, 1·1 × ·85, *c* $\frac{1}{30}$–$\frac{1}{25}$; f^{la} ·35 × ·45; *br* ·6 × ·7; *per* ·85 × ·35^{mm}.

Late laxe repens pallida tenerrima crebre florifera. Caules pollicares et longiores bipinnati.

Folia subcontigua, longitudinaliter fere inserta, oblique subfalcato-oblonga rotundata, basi minutissime inflexa; cellulæ mediocres æquilateræ, ad marginem posticum basinque majores, omnes valde diaphanæ. Folia ramea longe minora.

Foliola dissita foliis 3-plo breviora oblato-orbiculata, ad vel ultra dimidium bifida, sinu triangulari, apicibus acutis.

Flores monoici: ♀ in ramulis iteratim innovatis seriatim secundi. Bracteæ foliis $\frac{1}{3}$ breviores, ligulato-lanceolatæ elobulatæ; bracteola late ligulata breviter bifida.

Perianthia foliis caulinis breviora, subemersa, obpyramidato-clavata compressula, supra medium (vel fere a basi) alte 5-carinata, carinis sublævissimis apice lato truncatis, rostello perbrevi.

Andrœcia ramulo tenui incurvo, folio collaterali subbreviore, constantia; bracteæ 4–9-jugæ parvæ cito marcescentes.

Var. *arenicola*. Folia minora sæpius dissita, basi longe decurrente omnino elobulata, cellulis submajoribus.—In fluminis *Orinoco* arena, infra *Esmeralda*.

Var. *minutiflora*. Foliola foliis 4-plo breviora. Bracteæ fl. ♀ minutæ parvilobulatæ. Perianthia carinis apice rotundato-truncatis. Andrœcia minuta, bracteis 2-jugis.—Ad *S. Gabriel*, cum typo, in *Gymnopteridis* fronde.

Taxi-L. implexa S. a priori distat caule crassiore; foliis duplo fere minoribus, basi latioribus, apice angustioribus sæpius subacutis, arctius reticulatis; foliolis vix ultra $\frac{1}{3}$ bifidis; perianthiis brevioribus minus alte carinatis, carinis apice rotundo-prominulis (nec truncatis).

7. TAXI-LEJEUNEA TENAX, Spruce.

Hab. Caripi, prope *Pará*, in saxis maritimis, sterilis.

F 1·1 × ·95; *lob* ·2; *c* $\frac{1}{3-2}$; *f*^{la} ·35 × ·35; *br* ·65; *br*^{la} ·6 × ·3^{mm}.

Late depresso-cæspitosa, viridis, siccando flavescens. Caules intricati, 2-pollicares *tenaces*, subcompressi, strato corticali cellularum majorum sectione compressarum pellucidarum, stratisque 2 v. 3 concentricis cellularum 3-plo angustiorum, constantes, vage ramosi, ramis valde inæquilongis, rarius subpinnati, pinnis interdum floriferis.

Folia subimbricata dissitave plana v. sæpius decurvula, haud raro torta, late semicordato-ovata, rotundata obtusave, rarius subacuta, integerrima, basi minute complicata; lobulus 5–6-plo brevior involutus, nunquam obsoletus; cellulæ mediocres subpellucidæ leptodermes, solum ad angulos parum incrassatæ, inferiores majores, submarginales plures multo minores.

Foliola foliis plus 3-plo breviora suborbiculata, ad medium bifida, segmentis acutis v. obtusis, sæpissime radicellifera.

Flores monoici (steriles solum visi): ♀ in ramo brevi semel bisve innovando-prolifero terminales (quasi seriatim secundi). Bracteæ foliis fere duplo minores, forma variæ, plerumque altera latior oblique ovata obtusa, altera lanceolata acuta, lobulo angusto lineari plerumque auctæ; bracteola ovali-lanceolata vix ad medium usque bifida; omnes bracteæ integerrimæ.

Amenta ♂ lateralia, folio caulino breviora, oblongo-subglobosa; bracteæ 2–3-jugæ majusculæ.

L. tenera, Sw.! Prodr. Fl. Ind. Occid. (ex ipso in hb. Hook.) fragilis est, nostra tenuior; foliis sparsioribus, tam latis quam longis, obsolete lobulatis; foliolis dimidio majoribus; bracteis longe minoribus; habitu tamen et foliis magnis valde similis.

8. TAXI-LEJEUNEA MACRORHYNCHA, Spruce.

Hab. Tavalosos Andium Peruvianorum, alt. 800^{m}, in filice.

F ·6 × ·4, ·6 × ·45, *c* $\frac{1}{2-5}$; *f*^{la} ·125 × ·125–·175; *br* ·5 × ·12; *br*^{la} ·4 × ·15; *per* ·65 × ·35, *rostellum* ·1^{mm}.

Pusilla tenuis viridis arcte repens intricata. Caules $\frac{1}{2}$–$\frac{3}{4}$ pollicis longi, inordinatim decompositi, ramis brevibus.

Folia subimbricata contiguave, basi latâ longitudinali subdecurrente inserta, oblique ovata abrupte acuta apiculatave—raro obtusa rotundatave—integerrima vel celluloso-subcrenulata, elobulata; cellulæ mediocres parum elongatæ convexulæ pellucidissimæ.

Foliola foliis 4-plo breviora distantia subrotunda, ad vel infra medium bifida, segmentis ovato-lanceolatis acutis.

Flores monoici: ♀ crebri, in ramo brevissimo terminales, innovatione iteratim proliferâ vel simplice suffulti. Bracteæ foliis breviores suberectæ anguste lanceolatæ acutæ, basi parvi-lobulatæ (vel altera non); bracteola lanceolata breviter (ad $\frac{1}{6}$) bifida, segmentis acutis, tenuissima.

Perianthia foliis sublongiora clavato-oblonga vel pyriformia longirostria subcompressa 5-carinata, carinis apice rotundis vix prominulis obscure subpapulosis, demum 4-fida, lobis cuspidatis.

Amenta ♂ lateralia folio collaterali sæpius longe breviora; bracteæ 1–3-(raro usque ad 5-) jugæ.

Obs.—The ♀ branches are rarely uniflorous—very mostly they are repeatedly floriferous, one or two pairs only of leaves intervening between two consecutive flowers. This character, and the usually acute leaves, have induced me to place the species in *Taxi-Lejeunea* rather than in *Eu-Lejeunea*, to which its humble stature assimilates it.

9. TAXI-LEJEUNEA OBTUSANGULA, Spruce.

Hab. Ad fluvium *Guamá*, prope *Pará*, in palmarum truncis.

F ·8 × ·7, *lob* ·15, *c* $\frac{1}{5-2}$; *f*^{la} ·45 × ·55; *br* ·75; *br*^{la} ·6 × ·5, ·6 × ·4; *per* 1·1 × ·45, 1·0 × ·45^{mm}.

Prostrata, matteolas latas sistens, pallide viridis, ad ramos rufescens. Caules 1–2-pollicares parce vage ramosi.

Folia inferiora subdissita, superiora ad $\frac{1}{3}$ lat. imbricata majoraque, patentia plano-decurvula, longitudinaliter inserta, prælate semicordato-ovata, subabrupte acuta, integerrima vel rarius apice angulata subdenticulatave, basi antica caulem late transeuntia, postica recte complicata; lobulus folio 5-plo minor semiovatus inflatus apice incurvus; cellulæ mediocres planæ pellucidæ, marginales convexulæ.

Foliola imbricata dimidium folium superantia (inferiora minora dissita), cordato-orbiculata-subovatave, paulo latiora quam longa, ultra $\frac{1}{3}$ obtuse bifida, sinu fundo lato lunulari, segmentis acutis inæquilongis.

Flores monoici: ♀ rari, in ramo brevi terminales, innovatione simplice —raro iterum florifera—suffulti. Bracteæ foliis minores, erectæ lanceolatæ acutæ crispulæ, obtuse denticulatæ integerrimæve, a basi ad $\frac{1}{3}$ alt. lobulo lineari auctæ; bracteola obovata ad $\frac{1}{3}$ acute bifida, segmentis acutis.

Perianthia emersa, foliis caulinis longiora, clavato-oblonga, supra medium constricta, apice dilatato rotundata, inferne teretia apicem versus 5-gona, angulis vix carinatis, demum apice fissa totaque fere longitudine teretia.

Andrœcia brevia tenuia; bracteæ paucijugæ.

Quoad ramum ♀ plerumque uniflorum inter *Eu-Lejeuneam* et *Taxi-Lejeuneam* exacte media est. *Taxi-L. asthenica*, specie affinis, foliis obsolete lobulatis; foliolis minoribus haud cordatis, sinu apicis acuto; ramis ♀ multifloris, etc., distincta est.

10. TAXI-LEJEUNEA FLORIDA, Spruce.

Hab. In valle *Leito* Andium Quitensium, ad arbores, alt. 2500^{m}.

F ·8 × ·7, *c* $\frac{1}{3-5}$—$\frac{1}{3-0}$; *f*^{la} ·35 × ·4; *br* ·55 × ·3; *per* ·8 × ·38^{mm}.

Tenella cæspitosa saturate viridis valde floribunda. Caules subsemipollicares procumbentes implexi, pinnati vel subbipinnati, ramis superioribus confertis, inferioribus sparsis.

Folia parum imbricata, ad angulum 50°–60° patentia, subplana, oblique late ovata subabrupte acuminulata acuta, basi antica dilatata caulem paulo transeuntia, postica decurrente lobulo 0 vel obsoletissimo; cellulæ mediocres leptodermes pellucidæ.

Foliola foliis duplo minora ovato-orbiculata ad medium fere bifida, sinu triangulari subobtuso, segmentis acutis, basi rotundata vel obscure cordata.

Flores monoici; ♀ ad ramulos microphyllos seriatim secundi, pauci (1–3) ad quemque ramulum. Bracteæ foliis dimidio breviores erectæ oblongæ vel semiobovatæ apiculatæ obtusæve, lobulo nullo vel minutissimo; bracteola obovata emarginato-bifida.

Perianthia subemersa obconica clavatave minute rostellata, alte 5-carinata, carinis papulosis; primum ab ipsa basi carinata, demum turgescentia fere teretia, solum apicem versus 5-carinata, carinis apice rotundatis nec prominulis.

Amenta ♂ lateralia, folio caulino collaterali breviora, oblongo-rotunda, bracteis 3-jugis majusculis, vel longiora, bracteis 5-jugis.

Foliis, bracteis bracteolisque, omnibus integerrimis, a plerisque *Taxi-Lejeuneis* differt.

11. TAXI-LEJEUNEA ASTHENICA, Spruce.

Hab. *S. Carlos del Rio Negro*, in "caatingas," ad arborum truncos ramosque; *Tarapoto*, secus rivulos, supra alias hepaticas repens, alt 600m.

F ·8 × ·8, ·75 × ·68, *c* $\frac{1}{30}$; *f*^{la} ·3 × ·35, ·2 × ·2, ·15 × ·15; *br* ·7 × ·3; *per* 1·0 × ·4, ·7 × ·3mm.

Pallida pellucida flaccida, repens, ex parte pendula. Caules 1–3-pollicares tenuissimi pinnatim ramosi, ramis pro more brevibus.

Folia contigua vel paulo imbricata, angulo 70° patentia, plana vel decurvo-secunda, longitudinaliter inserta, late semicordato-ovata apice decurvo acuminulata acuta vel sæpius 2–3-dentata, basi obsolete lobulata; cellulæ mediocres pellucidæ subconformes.

Foliola inferiora parva distantia, foliis 5-plo minora, superiora solum 2½-plo minora, cordato-orbiculata, ad medium fere bifida, sinu segmentisque acutis.

Flores monoici: ♀ in ramis ramulisque homotropo-innovandis seriatim secundi. Bracteæ foliis subminores oblongo-lanceolatæ, apice trifidæ vel subspinulosæ, basi lobulo minuto inflexo digitiformi auctæ; bracteola oblonga ad ⅓ bifida paucidentata.

Perianthia subemersa subcylindrica vel anguste obconico-pyriformia, medio supero 5-carinata, carinis minus altis apice rotundato-subprominulis, minute rostellata.

Andrœcia folio caulino longe breviora; bracteæ minutæ sub 3-jugæ.

12. TAXI-LEJEUNEA BOMBONASENSIS, Spruce.

Hab. Ad pedem Andium Quitensium, secus fluvium *Bombonasa*, in cortice.

F ·9 × ·9; *c* $\frac{1}{32}$; *f*$^{la}_{..}$ ·4 × ·4; *br* ·8; *br*^{la} ·75 × ·35; *per* ·65–·75 × ·3mm.

Late laxe repens, tenella virescens. Caules bipollicares tenues bipinnati; rami inæquilongi sæpe florescentiis ♀ et ♂ pinnulati.

Folia contigua vel subdissita, fere longitudinaliter inserta subplana, late suboblique semicordato-ovata, subacuta obtusave, alia leviter acuminata, basi postica lenissime incurva vel omnino eplicata; cellulæ mediocres æquilateræ subpellucidæ.

Foliola distantia, foliis plus duplo minora, orbiculata ultra medium bifida, segmentis subacutis.

Flores monoici: ♀ ad ramos ramulosque abbreviatos terminales, basi innovationem plus minus iteratim floriferam proferentes (unde

laterales et seriatim secundi viderentur). Bracteæ foliis subbreviores lanceolatæ obsolete denticulatæ angulatæve, antice brevi spatio sæpe connatæ, lobulo minuto quadrato; bracteola obovato-lanceolata vel subrhomboidea ad medium bifida, segmentis acutis.

Perianthia vix emersa clavato-pyriformia retusula obscure rostellata, inferne teretia supra medium 5-carinata, lævia, post capsulam emersam basi sæpe elongata quasi-stipitata.

Androecia ad ramos sparsa brevia spicæformia recta; bracteæ 3–6-jugæ.

Anne inter *Taxi-L. implexæ* varietates enumeranda? Differt autem foliis majoribus latioribus; foliolis præcipueque bracteolis magis profunde fissis.

13. TAXI-LEJEUNEA IMPLEXA, Spruce.

Hab. In arborum cortice ad fluvii *Negro* cataractas, necnon secus fl. *Huallaga* juxta *Yurimaguas* et *Tarapoto*.

F ·8 × ·7, ·625 × ·6, *c* $\frac{1}{36}$; *f*^{la} ·3 × ·35, ·2 × ·2; *br.* ·7; *per* ·75 × ·35^{mm}.

Pallide viridis tenera prostrata. Caules 1–2-pollicares subpinnatim decompositi implexi.

Folia subimbricata plana, oblique vel fere longitudinaliter inserta, late semicordato-ovata abrupte acuta vel subacuminulata—raro rotundata—integerrima vel apice angulari-denticulata, basi decurrente angustissime inflexa, lobulo minuto inflato vel subnullo; cellulæ parvulæ subconformes æquilateræ pellucidæ.

Foliola sub 3-plo breviora orbiculata (suboblata) ad $\frac{1}{2}$ acute bifida, segmentis acutis.

Flores monoici: ♀ ad ramulos microphyllos seriatim secundi (revera in innovationibus perbrevibus successivis terminales). Bracteæ foliis subæquilongæ lanceolatæ subacuminatæ subdenticulatæ, anguste lobulatæ vel non; bracteola libera oblonga vel cuneato-lanceolata ad $\frac{1}{3}$ anguste bifida, segmentis subacuminatis, utrinque uni-pauci-denticulata.

Perianthia subemersa clavato-oblonga brevirostria vix compressula, superne altiuscule 5-carinata, carinis apice rotundo-prominulis sublævibus.

Amenta ♂ lateralia, folio collaterali plus minus breviora—rarissime in ramo terminalia—tenuia deflexa; bracteæ 5–8-jugæ parvæ.

Var.? *callistachya* S. Folia sæpe latiora densiora. Foliola paulo ultra $\frac{1}{3}$ fissa. Flores ♀ sæpius in ramis normalibus, iteratim proliferis—rarius in ramulis parvifoliis—positi. Bracteæ undulatæ parce grosse serratæ. Perianthia fere a basi carinata, carinis superne insiguiter compressis alæformibus interdum papulosis. Androecia nonnulla valde longispica, bracteis ad 20-jugis.—Ad fl. *Negro* cataractas cum typo.

Var.? *retiflora* S. Major albescens. Folia apice rotundata, superiora interdum solum obtusa—nunquam acuta. Perianthia obconica altiuscule 5-carinata pellucido-reticulata. Bracteæ integerrimæ vel grosse subdenticulatæ.—Ad *Yurimaguas* juxta fl. *Huallaga*.

14. TAXI-LEJEUNEA TAPAJOSENSIS, Spruce.

Hab. Ad fluminum Amazonum et *Tapajos* confluentiam, in ramorum cortice.

F ·75 × ·65, *lob* ·1, *c* $\frac{1}{35}$; *f*^{la} ·4 × ·35; *br.* 5; *br*^{la} ·4 × ·25^{mm}.

Albescens tenuis arcte repens. Caules 2-pollicares subpinnatim ramosi, ramis brevibus, subparalleli.

Folia paulo imbricata late semicordato-ovato-oblonga, rotundata integerrima, raro subangulata, margine toto cellulis parvis quadratis limbata, basi brevissime inflexa, plicâ folio 7-plo breviore rhomboideâ acuta planâ vel subinvolutâ; cellulæ $\frac{1}{35}^{mm}$ pellucidæ, inferiores submajores.

Foliola foliis duplo breviora orbiculata vel late elliptica, profunde (fere ad $\frac{3}{4}$) bifida, sinu segmentisque subacutis, cellulis iis foliorum duplo minoribus.

Flores dioici: ♀ ad ramos monotropo-innovandos (raro parvifolios) seriati, pauci (sub 2); bracteæ (juniores), foliis longe minores ovales obtusæ profunde bifidæ, lobulo linguæformi acuto; bracteola minor oblonga ad $\frac{1}{4}$ acute bifida, apicibus acutis.

Perianthia deerant.

Foliolis fere bipartitis distincta. Forsan *Hygro-Lejeunea* erit.

15. TAXI-LEJEUNEA PARAENSIS, Spruce.

Hab. Caripí prope *Pará*, in arboris vetustæ cortice.

F. ·75 × ·6, ·85 × ·75; *lob* ·1, *c* $\frac{1}{35}$; *f^ta* ·3 × ·35^mm.

Elatiuscula, prostrata pallide viridis; caules 1–1½-pollicares intricati paulo subpinnatimque ramosi.

Folia flaccidula subdecurva subimbricata, oblique semicordato-ovata, apice vix obliquo sensim brevi-acuta, basi subrecte complicata, lobulus folio fere 8-plo brevior, foliorum caulinorum ad pliculam angustam redactus, ramorum subinflatus; cellulæ $\frac{1}{35}^{mm}$. subpellucidæ, annulo angusto opaco cinctæ, parietibus incrassatis, convexo-prominulæ (unde folia margine celluloso-erosula).

Foliola foliis 2½-plo minora, orbiculata, paulo latiora quam longa, ad medium bifida, segmentis subacutis.

Fl. dioici. Androecia (rudimentaria) cauligena, minutula, bracteis paucijugis.

SUBGENUS XXVI.—*MACRO-LEJEUNEA*, S.

Subgenus, *Taxi-Lejeuncis Codonocoleis* e perianthiis parvis inflatis ecarinatis, apice solo corrugatis, affine, differt *ramulis* ♀ *simplicissimis unifloris* et florescentia dioica.—Caules interdum inordinate elongati, flaccidi simplices pinnative, sæpe florescentiis pinnulati. Folia plerumque convolutiva acuminataque, raro obtusa. Foliola persæpe maxima cordata. Cellulæ mediocres parvulæve vix incrassatæ.

Hab. et *Distr.* Ad arborum truncos, ramulos foliaque, etiam ad saxa, in montibus tropicis sylvaticis, ad alt. 3500^m usque. Species 4 hucusque cognitæ sunt, sc. *L. pallescens* Mitt. et *L. apiculata* Spruce, ex Andibus Quitensibus et Peruvianis; *L. lincata* L. et G. ex Antillis (etiam ex ins. Borboniæ ?); et *L. prominula* Gotts. ex Andibus Columbiæ.

1. *Macro-L. pallescens.* Prælonga pallida. F. dissita erecto-patentia convolutiva semicordato-ovata acuminulata integerrima, raro apice subdenticulata, lobulo triplo breviore inflato v. obsoleto. Foliola foliis fere æquimagna, breviora, late cordato-ovata ad $\frac{1}{3}$ bifida, segmentis erectis acuminulatis. Br. foliis plus duplo minores subæquilobæ serratæ; bracteola cuneato-lanceolata vix ad $\frac{1}{3}$ bifida.

2. *Macro-L. subsimplex.* Sordide viridis flavidave. F. subimbricata divergentia subplana semicordato-ovata ex rotundo apiculata cellulosocrenulata, lobulo 6-plo breviore inflato. Foliola æquimagna cordatoreniformia ultra $\frac{1}{3}$ bifida, segmentis acuminatis. Br. foliis subbreviores subæquilobæ integerrimæ; bracteola obovata vix ad $\frac{1}{3}$ bifida.

[*Macro-L. lineata.* Sordide flavida. F. subimbricata divergentia falcata cordato-lingulata obtusa, lobulo parvulo valde ventricoso fere globoso. Foliola plus duplo breviora ovato-rotunda ad $\frac{1}{3}$ bifida, segmentis acutis. Br. foliis longiores valde falcatæ anguste lobulatæ; bracteola solum emarginata. Per. cylindrica subcompressa ecarinata apice quadrangula.—*Ins. Antillis.*]

1. MACRO-LEJEUNEA PALLESCENS, Mitt. !

In Hook. Journ. Bot. (1851), p. 360.

Hab. Andes Quitenses in montibus *Guayrapata*, *Tunguragua*, etc., in m. *Azuay* fertilis, ex arborum ramis pendula.—In herb. Hook. adest, prope *Quito* a JAMESON lecta.

F 1·6 × ·7, 1·0 × ·6; *c* $\frac{1}{40}$—$\frac{1}{30}$; *f*^{la} 1·0 × ·9, ·6 × ·6; *br* ·5–·6 *longæ*; *per* ·7 × ·4^{mm}.

Pallide viridis flavidave flaccidissima substratificata; caules 4–9-poll. longi tenues subsimplices, raro subpinnatim ramosi, ramis dissitis inæquilongis, aliis brevissimis floriferis, ♀ vel ♂.

Folia dissita v. vix imbricata, tenuia, erecto-patula, convolutiva, basi longe decurrentia oblique semicordato-ovata, subabrupte acuminulata acuta integerrima v. apice angulata raro subdenticulata, basin versus sinuato-complicata; lobulus lobo 3-plo brevior, v. minutus, raro obsoletus, ovato-rhombeus inflatus, apice acuto inflexo raro explanato; cellulæ mediocres parvulæve, leptodermes æquilateræ pellucidæ, fere planissimæ, inferiores sensim majores.

Foliola subimbricata foliis sat breviora sæpe autem latiora cordato-ovata ad v. paulo ultra $\frac{1}{3}$ bifida, segmentis acutis acuminulatisve parallelis v. forficatis, auriculis baseos majusculis subimbricatis v. recurvis, lateribus insigniter incurvis.

Flores dioici: ♀ cauligeni ramigenique minuti, f. caulino breviores, innovatione nulla suffulti; bracteæ bijugæ, exteriores minutæ, interiores foliis plus duplo minores, vix ad $\frac{1}{2}$ usque bilobæ, lobis ovali-lanceolatis acutis serratis, inferiore subangustiore; bracteola cuneato-lanceolata, fere ad $\frac{1}{3}$ bifida, segmentis subacuminatis, serrulata, hinc cum bractea basi connata.

Perianthia f. caulinis subduplo breviora, obconico-pyriformia, inflata lævissima, apice rotundato-depresso obscurissime 4–5-umbonulato, ore minuto, rostello nullo. Calyptra vix brevior tenuis, apice irregulariter rupta. Capsula globosa.

Amenta ♂ in planta propria robustiore (!) cauligena, f. caulinis sublongiora decurva albida; bracteæ 6–10-jugæ parvæ subconfertæ valde concavæ bilobæ, lobis subæqualibus ovatis obtusis. Bracteolæ ovales apice bifidæ.

The ♀ flowers are terminal on very short ramuli, which *never innovate*, and have only one pair of minute leaves (or bracts) below the involucre proper. These ramuli are often pretty copiously

scattered along the stem and branches; they spread horizontally and distichously, and thus differ essentially from the multiflorous ♀ branches of Taxi-Lejeunea.

2. MACRO-LEJEUNEA SUBSIMPLEX, Mont.

Ann. des Sciences Nat. (1843).

Hab. Andes Peruvianos, in montibus Tarapotensibus, ad saxa.

F ·65 × ·55; *lob* ·1; *c* $\frac{1}{30}$; *f*^{la} ·55 × ·7; *br* ·55; *br*^{la} ·5 × ·35^{mm}.

Prostrata substratificata, sordide flavida viridisve; caules 2–3-pollicares parum ramosi, flaccidi, ramique elongati, simplices v. floribus ♀ pinnulati, supra 3 cellulas lati.

Folia subimbricata, a basi brevi semierectâ saccatâ, abrupte divergentia, subplana, late oblique semicordato-ovata, ex apice inæquilatero-rotundato (margine postico convexiore) subabrupte apiculata acuta, apiculo 3–4c. longo, basi 2–3c. lato, margine toto celluloso-crenulata, antice sub apice denticulo sæpe aucto; lobulus folio 6-plo brevior inflatus margine transverso inflexo, apice occulto; cellulæ mediocres ad angulos perpaulo incrassatæ, granis chlorophylli oblongis in annulum angustum opacum congestis, cæterum pellucidæ, sinum versus subelongatæ.

Foliola cordato-reniformia, auriculis baseos majusculis, apice vix ultra $\frac{1}{3}$ bifida, segmentis contiguis acuminatis.

Flores dioici: ramuli ♀ simplicissimi laterales, folia caulina perpaulo excedentes, foliis infra-floralibus minutis 1- (raro 2–3-) jugis. Bracteæ propriæ foliis subbreviores acutæ integerrimæ, lobis lanceolatis, postico paulo breviore duplo angustiore; bracteola obovata vix ad $\frac{1}{3}$ bifida.

In monte *Campana* inveni formam tenuiorem magis et subpinnato-ramosam, foliis angustioribus, foliolis duplo minoribus suborbiculatis; quoad flores ♀ ceterosque cataracteres typo supradescripto omnino conformem. Mensura partium sequitur:

F ·65 × ·45, *lob* ·1; *c* $\frac{1}{35}$; *f*^{la} ·3 × ·3, ·35 × ·35^{mm}.

L. pallescenti et *subsimplici* plane affinis est *L. lineata* L. et Lg.! (in hb. Hook.—ex insula S. Christophori) quoad florescentias laterales simplicissimas et perianthia lævia ecarinata; differt foliis falcatis obtusis, lobulo fere globoso.—In 'Synopsi Hep.' *L. subsimplex* descripta fuit *foliis omnino elobulatis*, unde eandem esse ac meam Andinam primum non recognovi; postea autem in Exsiccatis Antillanis Cl. Husnoti eandem vidi, Gottscheo nominatam, foliis lobulatis cæt. char. plantæ Andinæ perfecte conformem.

SUBGENUS XXVII.—*OTIGONIO-LEJEUNEA*, S

Plantulæ perianthiis fere teretibus, apice solo carinatis, carinisque in alam auriculamve, integram vel fissam, ultra perianthium recte productis; necnon e foliis laxe textis, sæpe elobulatis ad *Taxi-Lejeuneas Codonocoleas* accedere viderentur; valde diversæ autem statura pusilla, foliis etc. post

siccationem tardissime emollituris, foliolis parvis, interdum minutis, ramis ♀ haud parvifoliis (quamvis sæpe multifloris tanquam in *Taxi-Lejeuneis*), perianthiis pro more immersis.—*Eu-Lejeuneis Parvistipulis* quoad vegetationis organa majorem similitudinem habent; perianthiis lævibus apice solo carinato-auriculatis, calyptræ stylo protruso ad speciem longirostratis (rostello vero subnullo), longius divergunt.—*O. L. 5-umbonata*, pro perianthii carinis superne distinctioribus, apice autem solum in umbones prominulis, ab *O.-Lejeuneis* typicis recedit; specimina tamen aquam tardissime imbibunt, cæterisque caracteribus omnino cum *O.-Lejeuneis* convenit. Huic peraffinis est *Eu-Lejeunea Tarapotensis*, nexumque inter *Eu-Lejeuneas* et *Otigonio-Lejeuneas* bene præbet.—Quoad perianthium apice 3–5-cornutum-auriculatumve affinitatem aliquantulam cum *Cerato-Lejeunea* monstrat; auriculæ autem semper planæ, nec convolutæ (quales in *C.-Lejeunea*) sunt. *Cerato-Lejeunea* differt insuper statura majore, colore lurido, textura firmiore, presentia foliorum in utriculum magnum convolutorum, denique perianthiis.

Hab. et *Distr.* In sylvis tropicis densis ad truncos vetustos præcipueque ad putrescentes. Extra sylvam Amazonicam—ubi 5 species rarius et sporadice occurrunt, in Andibus supra 500^{m} alt. haud ascendentes—nullibi quantum scio inventæ.

1. *O.-L. xiphotis.* Dioica? F. rotundata raro subacuta, lobulata subcrenulata. Foliola fere 4-plo breviora ultra ½ bifida, segmentis acuminulatis. Br. foliis submajores subæquilobæ acutæ crenulato-serrulatæ; bracteola ovalis fere ad ½ bifida. Per. subimmersa pellucida ovalia, carinulis apicis in auriculas erectas lanceolatas plerumque integras productis.
2. *O.-L. schizotis.* Monoica. F. majuscula, omnia rotundata integerrima, pleraque elobulata. Foliola 5–7-plo minora ad ½ bifida, segmentis acutis. Br. foliis multo minores inæquilobæ; bracteola ligulata ad ⅓ bifida. Per. emersa pyriformia, apice 4–5-carinato-auriculata, auriculis 2–3-laciniatis conniventibus.
3. *O.-L. acanthotis.* Dioica. F. semicordato-ovata subacuta subcrenulata lobulata. Foliola 3-plo breviora ad ½ bifida, segmentis subacuminatis. Br. foliis majores inæquilobæ grosse serrulatæ; bracteola ovali-lanceolata subserrulata ad ⅓ bifida, segmentis tenui-acuminatis. Per. immersa clavato-pyriformia carinata, apice in auriculas 3 v. 4 erectas ligulatas (summo apice 3-spinulosas) producta.
4. *O.-L. cyrtotis.* Monoica. F. rotundata, ramea subacuta, elobulata Foliola plus 3-plo minora ad ½ bifida, segmentis subobtusis. Br. foliis æquilongæ integerrimæ, altera elobulata; bracteola ovalis breviter bifida. Per. immersa clavato-cylindrica, carinis apicis in cornua brevi-subulata porrectis.
5. *O.-L. 5-umbonata.* Monoica. F. abrupte acuta, inferiora rotundata, sæpissime elobulata. Foliola subtriplo minora ad ½ bifida. Br. foliis longiores crenulatæ subserratæ parvilobulatæ; bracteola obovato-lanceolata bidentata. Per. immersa pyriformi-oblonga supra medium 5-carinata, carinis apice in cornua (umbonesve) brevissima obtusa porrectis.

1. OTIGONIO-LEJEUNEA XIPHOTIS, Spruce.

Hab. Tauaú, prope *Pará*, in cortice.

F ·38×·30, *lob* ·09, *c* $\frac{1}{3\cdot5}$; f^{la} ·1×·125; *br. lobus* ·4×·15; br^{la} ·4×·25; *per* ·4×·25^{mm}.

Pusilla pallida repens, aliis *Lejeuneis* intricata. Caules semipollicares vage subramosi, apice sæpe longe simplices.

Folia subimbricata subdecurvo-concava, basi angusta inserta, late dimidiato-ovata, vel cuneato-obovata, rotundata—raro abrupte acuta, parum celluloso-crenulata, margine postico supra lobulum recto vel subconcavo basin versus recte vel subsinuato-complicata; lobulus folio 4-plo brevior turgide ovoideus, sinu excisulo, apice sæpius occulto; cellulæ parvulæ æquilateræ pellucidæ.

Foliola distantia, foliis 4-plo fere breviora, subrotunda, ultra medium acute bifida, sinu lato, segmentis subdivergentibus acutis acuminulatisve.

Flores dioici (?): ♀ in ramo brevissimo terminales, innovatione suffulti. Bracteæ foliis sublongiores, perianthium obtegentes, ad $\frac{2}{3}$ complicato-bilobæ, angulatæ et celluloso-crenulatæ—raro etiam hic illic subdenticulatæ, lobis lanceolatis acutis subæqualibus vel inferiore angustiore; bracteola ovalis vel longe obovata, vix ad medium anguste bifida, segmentis acuminulatis.

Perianthia subimmersa parva pellucida, ovalia ovatave, subteretia, solum apicem versus 4–5-carinata, carinis apice in auriculas lanceolatas linearesve, integras vel 2–3-fidas erecto-conniventes protractis; infra auriculas constricta, apice pertusa erostria. Calyptra pyriformis capsulæ æquilonga, stylum e perianthii orificio ultra auriculas exsertum apice gerens.

2. OTIGONIO-LEJEUNEA SCHIZOTIS, Spruce.

Hab. In fl. *Negro* et *Uaupés* ripis, ad truncos inundatos etiam ad prostratos putrescentes.

F ·7 × ·5, *c.* $\frac{1}{36}$–$\frac{1}{30}$; *f*^{la} ·1 × ·07, ·15 × ·1; *br* ·5; *br*^{la} ·4 × ·13; *per* ·65 × ·35; *br* ♂ ·1–·15^{mm}.

Pusilla viridis in stratum tenue effusa. Caules $\frac{1}{2}$–$\frac{3}{4}$-pollicares, repentes, sat ramosi vel etiam decompositi, ramis paucifoliis.

Folia contigua vel parum imbricata, assurgentia plana longitudinaliter inserta, oblique oblonga, vel (basi subdilatata) ovato-oblonga rotundata elobulata, alia subfalcata; cellulæ mediocres, centro pellucidæ ambitu opacæ, inferiores sensim majores.

Foliola distantia, cauli appressa eodemque vix latiora, foliis 5–7-plo minora, ovata, ad $\frac{1}{2}$ bifida, segmentis lanceolatis acutis.

Flores monoici: ♀ in ramo sæpe iteratim innovando-prolifero terminales. Bracteæ f. caulinis multo minores, ab apice ad $\frac{1}{3}$ solum bifidæ, dein complicatæ; lobo ligulato-oblongo rotundato-truncato, lobulo lineari-rhomboideo apice libero triangulari-lanceolato acuto; bracteola ligulata breviter (ad $\frac{1}{6}$–$\frac{1}{3}$ alt.) acute bifida, segmentis acutis.

Perianthia f. caulinis subæquilonga, pyriformia teretia, solum apicem versus 5-carinata, carinis 4 (vel omnibus) apice cristato-auriculatis, cornutisve, cristâ in lacinias 2 vel 3 subulatas conniventes fissâ, rarius subulâ unicâ constante, vertice convexo perforata (orificio minuto vix tubulari), stylo fructus maturati prælongo alte protruso ad speciem rostellata.

Amenta ♂ crebra ramulo tenui constantia, plerumque folio collaterali longiora; bracteæ 5–7-jugæ minutæ (foliis 5-plo brevioribus), compresso-galeformes, apice acuminato-subrostrato sæpius integra.

3. OTIGONIO-LEJEUNEA ACANTHOTIS, Spruce.

Hab. San Carlos del Rio Negro, in cortice.

F ·55 × ·5, ·55 × ·5 ; *lob* ·125, *c* $\frac{1}{4\,0}$; f^{la} ·2 × ·25, ·18 × ·18 ; *br. lobus* ·8 × ·35; br^{la} ·75 × ·4; *per* ·7 × ·25^{mm}.

Pusilla prostrata pallide viridis. Caules $\frac{1}{3}$-pollicares bipinnatim subramosi intricati.

Folia subimbricata subplana horizontaliter patula, obscure falcata, semicordato-ovata abrupte subacuta, margine plus minus celluloso-erosula apiceque sæpe angulata denticulatave, basi sinuato-complicata; lobulus 5-plo fere brevior late semiovatus inflatus, margine incurvo ; cellulæ parvulæ pellucidissimæ, pariete trigonis parvis subincrassato, inferiores longiores latioresque vix autem in ocellum aggregatæ.

Foliola distantia, foliis triplo minora, orbiculata, ad medium bifida, segmentis subacuminatis, acutis.

Flores dioici: ♀ terminales, innovatione simplice proliferave suffulti. Bracteæ foliis majores complicato-bipartitæ, lobis lanceolatis acutis grosse serrulatis, inferiore paulo (vel duplo) minore; bracteola ovali-lanceolata, ad $\frac{1}{3}$ bifida, segmentis tenui-acuminatis, serrulata vel subintegerrima.

Perianthia bracteis immersa, clavato-pyriformia teretia (ecarinata), apice in auriculas 3 vel 4 erectas ligulatas (apice divaricato-3-spinulosas) protracta. Calyptra perianthium replens, pyriformis, stylo protruso coronata.

Otigonio-L. xiphotis differt foliis dimidio minoribus concavis integerrimis basi angustis (nec semicordatis); foliolis minoribus magis profunde bifidis; bracteis duplo minoribus integerrimis; perianthiis ovalibus apice carinatis, carinis in auriculas lanceolatas pro more integras protractis.

4. OTIGONIO-LEJEUNEA CYRTOTIS, Spruce.

Hab. Ad fl. *Cauapuna*, fluvio *Negro* tributarium, in truncis prostratis.

F ·75 × ·65, ·75 × ·5 ; *lob* 0 ; *c.m.* $\frac{1}{2\,0}$–$\frac{1}{2\,5}$; f^{la} ·2 × ·15 ; *br* ·75 × ·35 ; br^{la} ·5 × ·25 ; *per.* 6 × ·35, ·9 × ·35^{mm}.

Otigonio-L. xiphotis peraffinis, differt caracteribus sequentibus. Pallidior, tenerrima minus ramosa. Folia ovato-oblonga rotundata, ramea superiora sæpe obtusa subacutave ; cellulæ submajores (mediæ majusculæ, margines versus mediocres) leptodermes ambitu anguste opacæ. Foliola submajora ovali-rotunda orbiculatave ad $\frac{1}{2}$ bifida, segmentis acutis obtusisve. Fl. ♀ in ramo brevissimo terminales, innovatione parva *simplice* foliosa, v. *persæpe* ♂, suffulti; bracteæ longiores, ligulato-lanceolatæ plerumque acutæ, altera elobulata, altera lobulo perangusto lineari a basi ad medium aucta; bracteola longe brevior ovalis apice breviter bifida. Perianthia immersa (demum, basi elongata, subemersa) clavato-cylindrica compressula truncata brevi-rostellata, subteretia, solum apice ipso 4–5-carinata, carinis in cornua brevi-subulata porrectis, fructu egresso aperta, obconica, ore 10-dentata.

Amenta ♂ f. caulino breviora tenuia, sæpe in ramulo dimidio inferiore nudo terminalia; bracteæ 4–5-jugæ parvæ subconfertæ.—In ramulis raro adveniunt folia lobulo brevi aucta.

5. OTIGONIO-LEJEUNEA 5-UMBONATA, Spruce.

Hab. In sylva Amazonica, variis locis, præcipue secus fl. *Negro*, necnon in Andium radicibus ad *Tarapoto*; nusquam frequens, semper in cortice vetusto vigens.

F ·6 × ·4, ·5 × ·35, *lob* ·1–·2, *c* $\frac{1}{25}$–$\frac{1}{30}$; *f*^{ia} ·125–·2; *br* ·8 × ·3, ·9 × ·35, ·7 × ·3; *br*^{la} ·6 × ·35; *per* ·75 × ·3, ·55 × ·25^{mm}.

Pusilla viridis albicansve prostrata, matrici arcte adhærens, tenuis, tenerrima, post siccationem haud facile emollitura. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicares vage ramosi, interdum decompositi, ramis paucifoliis.

Folia basi sola imbricatula, subplana, oblique (vel subsemi-) ovato-oblonga, abrupte acuta obtusave, inferiora sæpe rotundata, margine pulchre celluloso-crenulata vel (rarius)-serrulata, plerumque elobulata, lobulo præsente tamen ovato folio 3–5-plo breviore; cellulæ mediocres valde diaphanæ fere vacuæ, pariete tenuissimo, inferiores sensim majores, marginales obtuse—rarius acute — prominulæ, cæteræ subplanæ.

Foliola distantia, foliis 4-plo minora, fragilissima, rotunda, ad $\frac{1}{2}$ bifida, segmentis acutis subobtusisve.

Flores monoici: ♀ terminales, innovatione florifera, ♂ vel ♀—raro neutra—interdum iterum innovata—suffulti. Bracteæ foliis dimidio longiores suberectæ, ligulato-oblongæ-lanceolatæve acutæ obtusæve celluloso-crenulatæ insuperque (sed rarius) grosse subserratæ, basi anguste complicatæ (vel non), lobulo minuto lineari, sæpe nullo; bracteola oblonga vel ovali-cuneata integra, retusula, vel breviter bidentata (in fl. sterili ad medium fere fissa).

Perianthia immersa, clavato-obconica vel anguste pyriformia, ex apice depresso insigniter conico-rostellata, subcompressa, inferne ecarinata, supra medium 5-carinata, carinis apice umbonato-prominulis—cornua rudimentaria obtusa, raro subacuta, fingentibus, cellulis extantibus dissitis pellucidis papillosis; demum, fructu egresso, obconico-campanulata, ore hiantia. Capsula globosa, in pedicello geniculato exserta.

Amenta ♂ rami apicem, rarius totum tenentia, flori ♀ adjecta dissitave; bracteæ 3–4-jugæ—raro usque ad 10-jugæ—majusculæ.

Otigonio-Lejeunea 5-umbonata inter hoc subgenus et *Eu-Lejeuneam* medium locum tenet, melius forsan ad posterius referenda.—*Eu-Lejeunea Tarapotensis*, perianthiis ad carinas apice prominulas papillosis, nostræ affinis est; differt foliis majoribus omnibus rotundatis integerrimis; foliolis pro ratione minoribus; bracteis foliis sat brevioribus (nec multo longioribus); demum perianthiis ab ipsa basi (nec apice solo) carinatis.

SUBGENUS XXVIII.—*HYGRO-LEJEUNEA*, S.

Plantæ elatæ speciosæ tenerrimæ laxe textæ valde hygrophoræ, recentes pallidæ, in sicco sæpe fuscescentes. Caules erecti, vel ex parte repentes ex parte penduli, sæpe dense stratificati, varie ramosi, ramis ♀ sæpissimo dichotomis, plantæ ♀ tamen steriliumque laxe pinnatim ramosi, ramis interdum microphyllis.

Folia magna, ·6–1·5^{mm} longa, ·45–1·1^{mm} lata, subimbricata, semicordata, plus minus acuta, raro obtusa rotundatave, lobo a sacculi basalis

apice sæpe angulo recto divergente, lobulo inflato interdum parvo nunquam obsoleto, integerrima v. sæpius celluloso-crenulata; cellulæ mediocres ($\frac{1}{40}$–$\frac{1}{24}$ mm), leptodermes v. ad angulos paulo incrassatæ, planæ v. sæpius convexæ (unde folia facie papulosa, margine crenulata, evadunt.)

Foliola in plurimis maxima, foliis æquimagna v. etiam majora—in paucis subminora—latiora quam longa, plus minus reniformia; basi sæpius cordata; apice in paucis speciebus perfecte integra, in pluribus brevissime bidentula, in paucis aliis ad $\frac{1}{4}$–$\frac{1}{3}$ (in nulla ad $\frac{1}{2}$) usque bifida; omnium sp. concava (lateribus incurvis), apice solo interdum reflexula, integerrima v. crenulata.

Flores constanter dioici, fœminei innovatione unilaterali, vel sæpius duabus oppositis, haud raro proliferis, suffulti. Bracteæ complicato-lobulatæ acutæ acuminatæve integerrimæ v. crenulatæ v. raro spinulosæ; bracteola sæpius obovata emarginata bifidulave, solum in *L. reflexistipula* integra.

Perianthia (in paucis observata) longe pyriformia subcompressa 5-carinata, carinis sublævissimis, apice rotundato prominulis—in *L. pentotantha* insigniter auritis.

Amenta ♂ parva, sæpe in ramulis terminalia; bracteæ 5-jugæ antheridia bina magna foventes.

Ab *Euosmo-Lejeuneis* differunt *Hygro-Lejeuneæ* (cæterum, habitu, foliolis magnis, etc. sat affines) odoris absentia, textura laxa; ramis ♀ persæpe dichotomis; foliis pro more majoribus tenerioribus acutis, cellulis pro m. leptodermibus; foliolis interdum integris; bracteis ♀ subspinulosis; perianthiis magis compressis, minus alte carinatis.

Hab. semper arborea, plerumque ad ramulos, rarissime ad folia viva, nunquam ad truncos putrescentes, in sylvis æquatorialibus tam planis quam montium editiorum.

Distr. In America 13 species legi, omnes fere in jugis Andium sylvaticis ad alt. 3500^{m} usque, quarum 2, *L. reflexistipula* L. et L. et *L. devoluta* n. sp., interdum in planitiem descendunt; 2 aliæ, sc. *L. mattcola* n. sp. et *L. intexta* n. sp. planitiei propriæ videbantur. Aliæ plures *Lejeuneæ* ab auctoribus descriptæ huc referendæ videntur, tales sunt *L. Loxensis* G., *L. Huanucensis* G., *L. Dominicensis* Mont., *L. cordistipula* L. et G., *L. cordifissa* Tayl., *L. flavicans* G., *L. Sullivantii* G., *L. hygrophila* G., *L. Choachina* G., etc. etc., omnes neotropicæ; paleotropicæ autem sunt *L. Lindenbergii* G. et *Montagnei* G., e descriptionibus ad idem subgenus referendæ.

A. *Foliola integra.*

a. *Fl. ♀ sæpissime dichotomiales.*

1. *H.-L. catinulifera.* Pusilla. F. rotundata integerrima, lobulo bis implicato $\frac{1}{2}$ folium fere æquante. Foliola fere duplo breviora, subcordato-reniformia rotundata cochleata. Br. cum bracteola connatæ. Perianthia obtuse carinata, innovationibus duabus suffulta.
2. *H.-L. patellifera.* A pr. differt minutie, caule sparso; foliis obtusatis papulosis, lobulo semel implicato ad plicam turgidissimo; foliolis orbiculatis planis; bracteis duplo minoribus liberis; perianthiis alte carinatis, innovatione unilaterali.
3. *H.-L. Spongia.* Elata tenerrima. F. obtusa v. subacuta, papulosa crenulata, lobulo 5-plo breviore. Foliola foliis æquimagna prælate reniformia retusa planiuscula. Br. liberæ.

b. *Fl. ♀ in ramo innovando seriatim secundi.*

4. *H.-L. reflexistipula.* F. lobulo minuto. Foliola foliis æqualia majorave prælate reniformia apice recurva.

B. *Foliola apice brevissime bidentula.*

5. *H.-L. Pastasensis.* F. late semiovata falcata oblique acuta apiculatave, raro apice denticulata; lobulus 3-plo brevior subplanus. Foliola foliis breviora, fere æquilata, cordato-orbiculata, ad $\frac{1}{9}$ fissa, dentibus apiculatis. Innovationes unilaterales. Br. f. breviores serrulatæ, lobis lanceolatis acuminatis; bracteola obovato-lanceolata ad $\frac{1}{6}$ fissa, segmentis acutis.

† [*H.-L. cerina* L. et L. F. semicordato-ovata acuminulata angulato-repanda celluloso-crenulata, lobulo parvo turgido. Foliola foliis imo majora, reniformi-rotunda subcordata rimâ apicali 5–7c. altâ vix ad $\frac{1}{6}$ bifida.—*Brasilia, Mexico.*]

6. *H.-L. devoluta.* F. late semicordato-ovata apice devoluto obtusata, raro subacuta, subcrenulata, lobulo vix triplo breviore subplano. Foliola fere duplo breviora cordato-reniformia, rima apicis 2–4c. alta, margine toto recurvula. Innov. plerumque oppositæ. Br. denticulatæ, lobis ovato-lanceolatis acutis; bracteola obovato-ovalis ad $\frac{1}{6}$ fissa. Per. subimmersa oblongo-pyriformia compressula, carinis 5 apice latioribus umbonato-prominulis.

7. *H.-L. fulva.* F. fragilia supra lobulum 5-plo breviorem saccatum divergentia, semicordato-ovata obtusata subcrenulata. Foliola vix minora orbiculato-reniformia basi profunde cordata, apice ad $\frac{1}{6}$ fissa, crenulata.

C. *Foliola apice ad $\frac{1}{4}$–$\frac{1}{2}$ alt. bifida.*

8. *H.-L. pentotantha.* F. supra basin saccatam patula cordato-ovata, apice valde decurvo tenui-acuminulata, crenulata, lobulo 3-plo minore. Foliola vix minora, profunde cordato-orbiculata, ad $\frac{1}{3}$ bifida, segmentis apiculatis. Br. foliis longiores ovales subacuminatæ laciniatæ; bracteola suborbiculata crispata, ad $\frac{1}{2}$ bifida, sublaciniata. Per. emersa obconica supra medium obtuse 5-gona, angulis apice in auriculas maximas dilatatis.

9. *H.-L. prionoides.* Pallida tenerrima. F. divergentia semicordato-ovato-lanceolata acutata sinuato-complicata, lobulo 5–7-plo breviore saccato. Foliola foliis superficie majora, prælate cordato-orbiculata, ad $\frac{1}{3}$ bifida, segmentis obtusis. Fl. ♀ dichotomiales. Br. foliis subconformes; bracteola foliolis similis, ad $\frac{1}{2}$ autem bifida.

10. *H.-L. heterocheila.* F. subdivergentia semicordato-ovato-oblonga acuminato-bispinosa, lobulo minuto. Foliola foliis paulo minora cordato-subreniformia ultra $\frac{1}{3}$ bifida, segmentis apiculatis.

11. *H.-L. rotundifolia.* F. supra basin saccatam suberectam divergentia, late semicordato-oblonga rotundata subcrenulata, lobulo 3-plo breviore. Foliola foliis æquimagna cordato-reniformia ad $\frac{1}{4}$ bifida, segmentis apiculatis. Fl. ♀ dichotomiales. Br. acutæ angulatæ; bracteola obovato-rotunda emarginata, segmentis contiguis acutis. Per. emersa clavato-oblonga valde compressa 5-carinata.

12. *H.-L. implexa.* F. semicordato-orbiculata erosula, lobulo 6-plo breviore vix inflato. Foliola vix minora cordato-orbiculata, ad vel ultra $\frac{1}{3}$ bifida, segmentis divergentibus acuminulatis. Innovationes fl. ♀ unilaterales. Br. obtusatæ; bracteola suborbiculata fere ad $\frac{1}{2}$ bifida, segmentis suberectis obtusis.

13. *H.-L. Matteola.* F. divergentia rhomboideo-oblonga rotundata, lobulo præminuto. Foliola fere æquimagna cordato-reniformia vix ad $\frac{1}{3}$ bifida, segmentis contiguis apiculatis. Innovationes fl. ♀ unilaterales. Br. acutæ; bracteola obovata fere ad $\frac{1}{2}$ bifida segmentis contiguis acuminatis.

1. HYGRO-LEJEUNEA CATINULIFERA, Spruce.

Hab. Andes Quitenses in nemoribus subalpinis, alt. 3000–3500 m., supra pagum *Quisapincha*, ad filices et folia emortua; in montibus *Altar* et *Mulmúl*, in truncis vetustis.

F ·9 × ·65; *lob* ·4 × ·15; *c.m.* $\frac{1}{3^2}$–$\frac{1}{2^5}$; f^{la} ·55 × ·75, ·5 × ·65; *br. lob* 1·3 × ·6, 1·0 × ·5; br^{la} 1·0 × ·4–·5; *per* 1·6 × ·65, 1·4 × ·65^{mm}.

Pusilla, pallide sordide flavida rufave tenera cæspitosa. Caules 1–1½-pollicares pinnatim v. subfastigiatim ramosi, ramis breviusculis assurgentibus erectisve, aliis paucis elongatis microphyllis.

Folia densiuscule imbricata, basi angusta inserta, patentia v. erecto-patentia, decurvo-concava, semicordato-ovata rotundata, fere dimidiata, medium versus sinuato-complicata, lobulus plus duplo brevior inflatus ovalis obtusus acutusve, subsaccatus, bis introflexus tamen, unde anguste fusiformis videretur; cellulæ mediæ mediocres æqualiter hexagonæ subleptodermes pellucidæ, marginales minores subquadratæ.

Foliola subcontigua ½ folium superantia subcordato-reniformia-orbiculatave, concava, margine toto incurvo, apice rotundato v. leniter retuso.

Flores dioici: ♀ crebriusculi sed plerumque steriles, terminales, innovatione unilaterali v. sæpissime binis oppositis suffulti. Bracteæ erectæ foliis longiores ad ½ bilobæ, lobo subovali obtusato, lobulo longe minore ligulato subtruncato; bracteola utrinque connata ovalis obtusa v. obtuse apiculata v. denique leniter emarginato-bifida.—Foliolum supremum infraflorale cæteris multo majus, orbiculatum subemarginatum.

Perianthia alte emersa pellucida, clavato-pyriformia plus duplo longiora quam lata, compressula, rotundato-truncata rostellata, antice 1-carinulata, postice obtuse 2-carinata, demum ore in lobulos 5 cuspidatos fissa, lævia. Calyptra oblongo-globosa perianthii dimidium inferiorem replens.

Inter *Hygro-Lejeuneas* et *Archi-Lejeuneas* fere media; teneritate, foliolis basi cordatis et perianthii carinis lævissimis magis ad priores, foliis bracteisque integerrimis ad posteriores, accedit. Neque a *Brachio-L. laxifolia* Tayl. longe distat; habitu necnon floribus ♀ normaliter dichotomialibus eadem; differt foliis rotundatis, lobulo haud crenulato, et foliolis cordatis incurvo-concavis—nec basi decurrente recurvis (qualia in *B. L. laxifolia*). —*L. Loxensis* Gotts. nostræ certe affinis, folia habet acuta, foliola rotunda subplana.

The leaves are very concave, or, when seen from above, convex, so that in the dried specimens they have a bullate appearance; this, and their pale colour, the narrow twice-infolded lobule, and (above all) the cordato-orbicular stipules, suffice to distinguish the species from *Archi-Lejeunea unciloba* and all its allies.

The microphyllous branchlets are not male spikes, but possibly indicate a tendency to revert to a former monoicous condition.

2. HYGRO-LEJEUNEA PATELLIFERA, Spruce.

Hab. In fl. *Pastasa* ripis infra *Baños*, supra *Frullanias* repens alt. 1600^{m}.

F ·65 × ·5, *lob* ·3–·4; *c* $\frac{1}{2}$–$\frac{1}{5}$; f^{la} ·25 × –·35; *br* ·6; br^{la} ·6 × ·25; *per* ·9 × ·4^{mm}.

Minutiuscula sparsa pallide viridis tenerrima. Caules $\frac{1}{4}$-pollicares fragiles vage ramosi, ramis brevibus subæquifoliis interdum arcuatis.

Folia imbricata concava subfornicata, valde oblique ovata late obtusata (forma fere cordis humani), celluloso-crenulata subpapulosa, medium versus sinuato-complicata; lobulus vix duplo brevior rectangularis rhomboideusve subacutus, ad carinam rotundatam valde inflatus cornu bovinum simulans, margine autem lobo majori appressus; cellulæ fere majusculæ subconformes, subpellucidæ, chlorophyllo sat copioso, pariete ad angulos paulo incrassato.

Foliola plus duplo breviora subdissita suborbiculata, fere plana, apice rotundata retusulave.

Flores dioici; ♀ in caule ramisque terminales, innovatione sæpius iterum florifera suffulti. Bracteæ foliis caulinis subminores ad $\frac{1}{2}$ bifidæ laxe complicatæ, lobo obovato-lanceolato rotundato, lobulo longe breviore anguste triangulari obtuso subacutove; bracteola lanceolata vel subcuneata, angusta, apice rotundata, basi utrinque connata.

Perianthia subemersa anguste obpyramidata vel subpyriformia vix compressa alte 5-carinata, carinis sparse celluloso-tuberculosis, ex apice retuso brevirostria demum 5-fida.

H. L. *catinulifera* S. certe distat statura multo elatiore, caulibus cæspitosis validioribus; foliis majoribus vix papulosis, textura paulo densiore, *lobulo bis implicato;* foliolis majoribus latioribus quam longis insigniter cochleatis; floribus ♀ sæpissime dichotomialibus; bracteis duplo longioribus; perianthiis obtuse carinatis.

3. HYGRO-LEJEUNEA SPONGIA, Spruce.

Hab. In monte *Tunguragua*, ad arborum ramulos, pl. ♀ sterilis; pl. ♂ in eodem monte supra *Leioscyphum Liebmannianum* repens: alt. 2400^{m}.

F 1·05 × ·85 (*cum lobulo*); *lob* ·2 (*ad plicam mensus*); *c* $\frac{1}{30}$; f^{la} ·8 × 1·15, ·7 × 1·1; *br. lobus ant.* 1·3 × ·8–·9; br^{la} 1·2 × ·9^{mm}.

Elata pallida tenerrima, siccando badia fuscidulave. Caules pollicares vel longiores e caudice brevi repente undique radiantes et in molem subglobosam diametro bipollicarem congesti, parum ramosi, vel subdichotomi, vel sæpe ramis brevibus—aliis floriferis (♀) aliis sterilibus parvifoliis—pinnulati.

Folia ad $\frac{1}{3}$ lat. usque imbricata patenti-divergentia, late oblique subsemicordato-elliptica ovato-ellipticave, apice decurvulo obtusa, rarius subacuta rotundatave, toto margine e cellulis prominulis crenulata, repandula, basi antica caulem excedentia, postica sinuato-complicata; lobulus parvus, folio 5-plo brevior, subovatus, convoluto-turgidus; sinu excisulus; cellulæ mediocres conformes æquilateræ leptodermes pellucidæ, utraque facie convexæ.

Foliola foliis æquimagna sed latiora quam longa, imbricata subplana, reniformia vel potius late obtuseque emarginata, angulis rotundatis, basi vel subcordata vel undulato-truncata, nec decurrentia, margine repanda crenulataque—quasi moniliata, e cellulis marginalibus cæteris multo minoribus in conum obtusum prominulis.

Flores dioici: ♀ ad ramos primarios ramulosque terminales, innovationibus duabus oppositis—raro una sola—suffulti. Bracteæ foliis longiores, ab apice ad $\frac{2}{3}$ complicato-bilobæ, lobo antico obovato-ovali subacuto, lobulo subduplo minore linguæformi apice sæpe subemarginato; bracteola obovata subspathulata undulata repanda, apice inæqualiter subacute emarginata.

Planta ♂ tenuior magis pinnatim ramosa. Amenta crebra, ramulo foliis caulinis plus minus longiore constantia, vel ejus apicem solum tenentia; bracteæ 5–8-jugæ, foliis plus duplo breviores, arcte equitantes, breviter subæqualiter bilobæ, dimidiis ovato-ovalibus concavis, gremio antheridia bina magna foventes.

L. Sullivantii Gottsche, Mex-Leverm. 196, in adnot., nostræ valde similis, ramificationem habet irregularem, folia hyalino-viridia ovalia subacuta, lobulo imo minore (= lobi $\frac{1}{8}$–$\frac{1}{5}$); bracteolas minores (·75^{mm} longæ); cæterum, quoad partium magnitudinem texturamque, foliolorum forma, etc., certe proxima.

Obs. L. Spongia forms globose tufts, like sponges, pale green without, white within, and always saturated with water, on the twigs of low trees (*Clethræ*, *Weinmanniæ*, &c.) on mount Tunguragua, at 8000 to 9000 Eng. feet.

4. HYGRO-LEJEUNEA REFLEXISTIPULA, L. et L.

In Lehm. Pug. V (1833); G. L. et N. Syn. Hep. 335.

Hab. Ad arborum truncos et ramulos, in sylvis humilioribus præcipue, prope *S. Gabriel* fl. *Negro* et *Tarapoto* Andium Peruvianorum (alt. 600^{m}). Habitat etiam in *Serra d' Estrella* Brasiliæ (BEYRICH).

F ·75 × ·7, ·6 × ·5, *lob* ·1–·08, *c* $\frac{1}{35}$–$\frac{1}{32}$; *f^{la}* ·6 × 1·0, 55 × ·85; *br* ·75; *br^{la}* ·7 × ·45; *per* 1·0 × ·5^{mm}.

Elata tenerrima albida, siccando flavescens fulvave, raro fuscidula, denso strato effusa vel subpendula. Caules 2–3-pollicares intricati flaccidi pinnatim ramosi, ramis hic illic confertis, pro more brevibus monotropo-proliferis.

Folia ad $\frac{1}{3}$ lat. imbricata, angulo recto divergentia, late oblique semicordato-ovata, plana decurvulave, inferiora rotundata, superiora obtusata vel abrupte subacuta, margine crenulata, basi sinuato-complicata; lobulus minutus, folio 6–9-plo brevior, rhombeus decurrens inflatus, apice sæpius occulto; cellulæ mediocres æquilateræ convexulæ, pellucidæ, chlorophyllo sparso vel in annulum tenuem congesto, pariete ad angulos et media latera incrassato.

Foliola arcte imbricata, foliis multo—interdum duplo—majora, subbreviora sed dimidio—duplo latiora, reniformia, apice lato reflexo integra, rotundata retusulave, basi ad insertionem alte excavata (*i.e.* longe lateque decurrentia), margine crenulata, tergo plerumque arhiza.

Flores dioici: ♀ in caule ramove subrecte innovando-prolifero terminales, igitur quasi seriati, rarius in ramo brevissimo unifloro, innovatione simplice subjecta, nunquam ex dichotomia. Bracteæ (fl. sterilis foliis longiores, fl. fertilis breviores) erectæ angulatæ crenulatæque, ultra $\frac{1}{2}$ bilobæ, lobis complicatis obovato-lanceolatis subacutis, postico paulo minore; bracteola obovato-cuneata retusa.

Perianthia altiuscule emersa pyriformia vel subclavata compressa 5-

carinata, carinis lævibus vel angulato-scaberulis apice latiusculis, anticâ minus altâ; post fructus emissionem varie rupta.

Hygro-L. Spongia, huic affinis, differt colore in sicco nigrescente; ramificatione plantæ ♀ dichotoma; foliis duplo fere majoribus ellipticis, lobulo paulo majore; foliolis pro foliorum ratione multo minoribus, apice emarginato-retusis; bracteis inæquilobis, lobulo duplo fere minore.

5. HYGRO-LEJEUNEA PASTASENSIS, Spruce.

Hab. In fl. *Pastasa* ripis, juxta fl. *Blanco* ostium, alt. 1500^{m} in arborum ramis.

F 1·5 × 1·1 (lat. ad lobuli apicem mensa); *lobulus* ·55 (*ad plicam*), ·4 (*juxta caulem*); *c* $\frac{1}{32}$; *f*^{la} ·9 × 1·0, *rima* ·1; *br* 1·0 × ·4^{mm}.

Pallide flavo-viridis, ætate subfulva, prostrata intricata. Caules 2-pollicares inæqualiter pinnati et subbipinnati, apice elongato simplices.

Folia subimbricata supra lobulum divergentia, late semiovata, scalpelliformia, apice decurvo subabrupte oblique acuta persæpeque minute apiculata, margine repanda integerrima vel apice paucidentata, infra medium subsinuato-(vel fere recte) complicata; lobulus 3-plo brevior semiovatus subplanus, basi brevi cauli adnatus, apice acutus; cellulæ mediocres, omnes fere conformes.

Foliola subimbricata foliis breviora vix angustiora, cordato-orbiculata planiuscula, apice reflexo brevissime (ad $\frac{1}{3}$) obtuse bifida, dentibus apiculatis forficatis, margine angulata.

Flores dioici: ♀ (juniores) in ramis brevibus innovando-proliferis terminales. Bracteæ complicato-bilobæ, lobis lanceolatis subacuminatis serrulatis, inferiore subbreviore duplo fere angustiore; bracteola ad $\frac{1}{6}$ bifida, segmentis acutis.

Differt a *L. rotundifolia* Mitt. foliis parum (neque longe et anguste) decurrentibus, apiculato-acutis, lobulo basi breviore inserto; foliolis apice ad $\frac{1}{9}$ solum (nec ad $\frac{1}{4}$) bifidis; cellulis minoribus; demum innovationibus unilateralibus nec oppositis.

6. HYGRO-LEJEUNEA DEVOLUTA, Spruce.

Hab. Lamas, Andium Peruvianorum, alt. 700^{m}, et *S. Gabriel* fl. *Negro*, in fruticum ramis.

F 1·15 × 1·0, ·95 × ·85; *lob* ·5 × ·38, ·25 × ·2, *c* $\frac{1}{35}$—$\frac{1}{40}$; *f*^{la} ·65 × ·9, ·5 × ·65; *br* 1·05; *br*^{la} 1·0 × ·6; *per* ·95 × ·65^{mm}.

Elatiuscula pallida, siccando fuscidula, tenerrima, in vivo semper humida. Caules bipollicares prostrati pendulive implexo-stratificati, anguste pinnati vel subbipinnati, ramis inæquilongis, aliis dichotomis.

Folia tenuia imbricata divergentia late semicordato-ovata apice decurvo-involuto obtusata rotundatave—raro abrupte subacuta, subacuta, celluloso-subcrenulata, sinuato-complicata; lobulus 2-4-plo brevior subplanus (plica tamen subconvexa) late ovatus rotundato-truncatus; cellulæ parvulæ subconformes, sat crassæ, pariete tenui, chlorophyllo parcissimo, subplanæ, marginales autem convexulæ.

Foliola imbricata, foliis duplo fere breviora, paulo angustiora, cordato-reniformia, apice brevissime emarginata — rima solum 2–4 cellulas alta—dentibus acutis conniventibus, subplana, celluloso-sub-

crenulata, margine toto (apicis præcipue) recurvulo, basi externa fasciam radicellarum linearem proferentia.

Flores dioici: ♀ in ramis primariis, necnon in ipso caule, terminales, plerumque ex innovationum dichotomia, raro innovatione unica (simplice proliferave) suffulti. Bracteæ foliis subminores profunde bilobæ complicatæ, lobis subinæqualibus, vel fere æqualibus, oblique obovato-lanceolatis acutis angulato-denticulatis—raro spinulosis, lobulo apice haud raro bidentato; bracteola obovato-ovalis ad $\frac{1}{6}$ bifida, segmentis acutis conniventibus, distanter angulato-denticulata spinulosave.

Perianthia subimmersa oblongo-pyriformia vix rostellata 5-carinata, carinis apice latiore rotundo-prominulis lævissimis. Calyptra pyriformis, perianthio duplo fere brevior, stylo ultra perianthium alte emerso.

Lejeunea cerina L et L.* (Syn. Hep. 391) folia habet minora, acute tenui-acuminulata, lobulo turgido; foliola, pro foliorum ratione, majora, lateribus valide incurvis, rima apicali 5–7 cell. alta.—*L. reflexistipula* L. et L. differt foliis longe minoribus subplanis; foliolis contra pro ratione multo majoribus, apice perfecte *integris*, basi haud cordatis; bracteis minus dentatis; bracteola apice integra, nec bifida; perianthiis alte emergentibus.

7. HYGRO-LEJEUNEA FULVA, Spruce.

Hab. Baños, ad pedem montis *Tunguragua*, in arborum radicibus.

F ·8 × ·6 (sine lobulo); *lobul* ·15–·2; *c* $\frac{1}{40}$; *f*^{la} ·6 × ·75^{mm}.

Procumbens, dense stratificata, fulva. Caules 2–3^{cm} longi, paralleli, flaccidi, parum ramosi, sæpe ramulis parvifoliis deciduissimis pinnulati.

Folia contigua v. parum imbricata, fragilia, a basi brevi erecta, cum lobulo in sacculum parvum semiparaboloideum coalita, subdivergentia, semicordato-ovata-oblongave, apice decurvo obtusata, margine parum celluloso-crenulata; lobulus 5-plo brevior, margine trans-

* *Lejeunea cerina* L. et L.! Pug. V. (1833) p. 16; *Lejeunea longiuscula* Tayl.! in hb. Hook. et in Lond. Journ. Bot. (1846) p. 394.—*Hab.* in Brasilia et Mexico.

Majuscula pallida tenera; caules breves parum vageque ramosi. Folia imbricata late patentia decurvula, semicordato-ovata acuminulata, apice brevi tenui acuto, margine toto celluloso-crenulata angulataque, basi sinuato-complicata, lobulo 4–5-plo breviore turgido acuto; cellulæ mediocres pellucidæ pariete incrassato. Foliola foliis imo submajora reniformi-rotunda, basi subcordata et alte incurrenti-excavata, lateribus valide incurvis, apice rimâ 5–7-cellulas altâ vix at $\frac{1}{6}$ longitudinis fissa.—F ·8 × ·55, *lob* ·2–·15, *c* $\frac{1}{30}$; *f*^{la} ·65 × ·8^{mm}.

Plantam Taylorianam autotypam, in monte Corcovado Brasiliæ lectam, examinavi; eadem est ac *L. cerina*, male tamen descripta, quum foliola superficie folium totum superantia, "dimidiam [solam] folii magnitudinem superantia," descripta sunt.

Lejeunea cordifissa Tayl.! Lond. Journ, Bot. (1846) p. 395.—*Hab.* Brasilia; Demerara; etiam ad pedem Andium Quitensium prope Esmeraldas (*Hall*). Secundum exemplaria Brasiliensia a priore differt colore sordide viridi, lobulo duplo minore, et foliolis (maximis) apice ad $\frac{1}{4}$–$\frac{1}{3}$ fissis.—Forsan hæ omnes, nostra *L. devoluta* inclusa, pro *L. cerinæ* formis habendæ.

verso; cellulæ parvulæ incrassatæ, intus sinuatæ, annulo chlorophylli angusto circumdatæ, cæterum pellucidæ, convexulæ.

Folia ramulorum 2–4-plo minora, magis concava, foliolis sæpe pro ratione majoribus.

Foliola foliis vix minora, subcontigua orbiculato-reniformia, basi profunde cordata, apice ad $\frac{1}{6}$ solum acute bifida, celluloso-crenulata, lateribus incurvis.

Flores nullos invenire potui.

8. HYGRO-LEJEUNEA PENTOTANTHA, Spruce.

Hab. In montis *Chimborazo* devexis occidentalibus sylvaticis, alt. 1500^{m}, ad ramulos foliaque viva.

F ·75 × ·6, *lob* ·25, *c* $\frac{1}{40}$—$\frac{1}{45}$; *f*^{la} ·65 × ·65; *br* ·9; *br* ·85 × ·75; *per* 1·1 × ·4 (*infra auriculas*) × 1·0^{mm} (*auriculis inclusis*).

Repens flaccida e viridi fusca. Caules 3–4^{cm} longi, tenues flexuosi simplices vel parum ramosi, ramis brevibus suboppositis.

Folia contigua, basi cum lobulo in sacculum semiconicum, folio triplo breviorem, connata, supra lobulum patentia, suboblique cordato-ovata, apice valde decurvo tenui-acuminulata, margine insigniter celluloso-crenulata; cellulæ parvulæ subconformes convexulæ, pariete ad angulos subincrassato, annulo chlorophylli angustiusculo.

Foliola foliis vix minora, imbricata orbiculata, concava, basi profunde cordata, apice ad $\frac{1}{3}$ bifida, rima angusta, segmentis acutis apiculatisve, margine celluloso-crenulata.

Flores dioici: ♀ in ramo terminales, innovatione unilaterali, vel duabus oppositis, suffulti. Bracteæ foliis longiores, ab apice ultra $\frac{1}{2}$ bilobæ, subcomplicatæ, lobis oblique ovalibus, subacuminatis undulatis sublaciniatis, postico plus minus minore; bracteola fere orbiculata, basi breviter angustata, ad $\frac{1}{2}$ bifida, valde undulato-crispa, parce laciniata spinosave.

Perianthia emersa obconica, supra medium obtuse 5-gona, angulis apice in auriculas maximas ovales compressas subdivaricatas dilatatis. Calyptra valida rufula, perianthium (sine auriculis) perfecte replens, apice varie lobata. Capsula in pedicello brevi articulato exserta, albida, globosa, ad basin fere usque quadrifida; elateres pauci prope valvularum apicem inserti, conniventes.

A *L. Dominicensi* Mont. et *L. cuspidata* G. (Syn. Hep. 351) differt foliolis profunde cordatis, segmentis apiculatis (nec transverse rotundis, segmentis obtusis vel subacutis); præcipue autem perianthio apice insigniter 5-auriculato. *Nota.*—Auriculæ perianthii clausæ sunt, bilamellatæ —nec lamella singula constantes, ac in *Otigonio-Lejeuncæ* speciebus.

9. HYGRO-LEJEUNEA PRIONOIDES, Spruce.

Hab. Andes Quitenses, ad *Rio Verde*, fl. *Pastasa* affluentem, alt. 1300^{m}, supra alias *Lejeuneas* et *Frullanias* repens.

F ·75 × ·35; *lob* ·1–·15, *c* $\frac{1}{3}$–$\frac{1}{5}$; *f*^{la} ·5 × ·6, ·55 × ·65; *br. lobus* ·8 × ·5, ·8 × ·35; *br*^{la} ·6 × ·75; *foliolum infraflorale* ·7 × ·9^{mm}.

Prostrata pallide viridis tenerrima. Caules 2-pollicares inæqualiter subpinnati.

Folia divergentia, plana vel apice torta, raro decurvo-secunda, basi sub-

imbricata, apice dissita, ovato-lanceolata acutata vel subacuminata acuta, basi antica semicordata caulem transeuntia, postica sinuato-complicata; lobulus parvus, folio 5–7 plo brevior, ovatus saccatus, apice subacuto occulto conspicuove; cellulæ parvulæ æquilateræ pellucidæ leptodermes, inferiores mediæ submajores.

Foliola late imbricata, maxima, folia superficie excedentia, oblato-cordato-orbiculata, ad $\frac{1}{3}$ acute bifida, segmentis ovatis obtusis, basi radicellifera, lateribus incurva.

Flores dioici: ♀ in caule ramove terminales, innovationibus 2 (minutis) oppositis suffulti. Bracteæ foliis parum diversæ, ad $\frac{1}{5}$ alt. usque bilobæ, lobulo lobo duplo breviore explanato, oblique oblongo rotundato; bracteola foliolis mediis major, eadem forma, ultra $\frac{1}{2}$ bifida, segmentis ovatis obtusis; foliola duo, florem proxime sequentia, bracteolâ imo majora, solum ad $\frac{1}{3}$ fissa.

Perianthia (valde juvenilia) 5-carinata glabra.

Androecia in caule ramisque terminalia; bracteæ 3–8(raro pluri) -jugæ, foliis sensim paulo minores, lobulo cum lobo in formam navicularem complicato, apice triangulari acuto. Antheridia binata maxima.

Lejeunea undulata L. et G. Syn. Hep. 768; Gotts. Mex. Leverm. 200, nostræ plane affinis, folia habet breviora, ovata, ex acumine sæpe apiculata; foliola foliis duplo fere minora, basi minus distincte cordata, segmentis autem ac in *L. prionoide* obtusis.

10. HYGRO-LEJEUNEA HETEROCHEILA, Tayl.!

Lond. Journ. Bot. 1846, p. 394. Syn. Hep. 768.

Hab. In M. *Chimborazo*, alt. 1500^{m}, ad arborum ramos (R. S.)—Antea in M. *Pichincha* lecta (JAMESON).

F 1·3 × ·8, *lob* ·125–·2, *c. mediæ* $\frac{1}{25}$, *inferiores* $\frac{1}{18}$; f^{la} ·85 × 1·0^{mm}.

Elata flaccida flavo-viridis, effusa vel pendula. Caules 3-pollicares, parum ramosi, ramis primariis elongatis, ramulis brevibus.

Folia magna, contigua vel lobulos solos imbricantia, angulo fere recto divergentia, oblique semicordato-ovato-oblonga, vel-ovato-lanceolata, acuminato-bispinosa, nempe extra apicem acute acuminatum dente minore acuminulato antice aucta, cæterum vel integerrima vel denticulo obtuso in medio sinu apicali interjecto, basi sinuato-complicata, lobulo minuto, folio 7–10-plo breviore, triangulari inflato; cellulæ mediocres pellucidæ, plurimæ suprabasales laxiores majusculæ.

Foliola imbricata, foliis perpaulo minora, cordato-orbiculata, subreniformia, paulo ultra $\frac{1}{3}$ anguste bifida, segmentis subcontiguis apiculato-acutis, lateribus plus minus incurva.

Flores nobis adhuc incogniti.

Hygro-L. prionoides S. diversa est teneritate; foliis angustis lanceolatis apice simplicibus; foliolorum segmentis obtusis.

11. HYGRO-LEJEUNEA ROTUNDIFOLIA, Mitt.! (TAB. IX.)

In Hook. Journ. Bot. (1857), p. 359.

Hab. Ad arborum ramulos, in valle fluvii Pastasa, secus fl. *Verde*, alt. 1300^{m}. In devexis occidentalibus montis *Pichincha* (JAMESON).

F 1·35 × 1·05, 1·25 × ·9; *lob* ·4–·45 × ·25; *c* $\frac{1}{24}$; f^{la} 1·0 × 1·35, ·9 × 1·5; *br* 1·1; br^{la} 1·0 × ·8; *per* 1·5 × ·7^{mm}.

Pendula flaccida pellucida albescens, dein flavicans fulvave. Caules 4–6-

pollicares simplices vel pinnati; rami brevissimi furcati, florem ♀ in furca gerentes, brachiis innovando-2–3-floris.

Folia magna tenerrima paulo imbricata subplana, supra plicam suberectam divergentia, late semicordato-oblonga apice decurvulo rotundata, obscure celluloso-crenulata, sinuato-complicata; lobulus 3-plo brevior, basi supra caulem alte incurrens, saccatus, quasi semipyriformis, margine transverso plano erosulo; cellulæ majusculæ subconformes pellucidæ fere vacuæ.

Foliola imbricata, foliis æquimagna sed oblata, cordato-reniformia, ad insertionem alte excavata, apice rima angusta ad $\frac{1}{4}$ bifida, segmentis apiculato-acutis—haud raro ipso apice connatis, margine celluloso-crenulata.

Flores dioici: ♀ in ramo perbrevi terminales, innovationibus binis iteratim innovatis suffulti. Bracteæ foliis subbreviores, erectæ planæ angulatæ ultra $\frac{1}{2}$ complicato-bilobæ, lobo spathulato-lanceolato subacuto, lobulo paulo breviore duplo angustiore ligulato-lanceolato acuto; bracteola obovato-rotunda brevissime emarginato-bifida, segmentis conniventibus acutis.

Perianthia emersa subclavato-oblonga, valde compressa, 5-carinata, supra medium sensim constricta (unde panduriformia) apice tamen lato truncata.

Planta pulcherrima, siccando haud nigrescens, more *L. Spongiæ* aliarumque Hygro-Lejeuneārum.

12. HYGRO-LEJEUNEA IMPLEXA, Spruce.

Hab. S. Carlos del Rio Negro, in trunco vetusto.

F ·65 × ·6, *lob* ·1, *c* $\frac{1}{35}$; f^{la} ·5 × ·65; *br* ·6–·65; br^{la} ·6 × ·6^{mm}.

Prostrata, plagas latas intricatas fuscescentes sistens. Caules bipollicares flaccidi flexuosi vage vel subpinnatim ramosi.

Folia ad $\frac{1}{3}$ lat. imbricata, plana tenuia valde decidua, profunde semicordato-orbiculata, raro subovata, integerrima vel cellulis prominulis erosula, basi antica caulem late transeuntia, postica sinuato-complicata, plica transversa; lobulus parvus folio 6-plo brevior triangularis, margine obliquo incurvo; cellulæ mediocres pellucidæ, ambitu anguste opacæ, pariete subincrassato.

Foliola imbricata, patentia vel squarrosula, foliis vix minora, oblato-cordata, laxe pellucide areolata, apice lato ad $\frac{1}{3}$ vel fere ad $\frac{1}{2}$ bifida, sinu late triangulari acuto, segmentis divergentibus acuminulato-acutis.

Flores dioici: ♀ in ramo brevi terminales, innovatione parva suffulti. Bracteæ foliis æquales ultra dimidium complicato-bilobæ, lobis subdimidiatis, antico ovali obtusato, lobulo subminore et duplo angustiore; bracteola æquilonga suborbiculata ad $\frac{1}{2}$ fere bifida, rima angusta, sinu depresso, segmentis subobtusis.

Hygro-L. Matteola, quoad foliola magna huic sat similis distincta est foliis multo angustioribus subrhomboideis laxius areolatis; bracteis acutis, bracteola angustiore.

13. HYGRO-LEJEUNEA MATTEOLA, Spruce.

Hab. Ad flum. Amazonum, in arborum cortice, prope *Pará* et secus canalem "*Paraná-mirí dos Ramos*" dictam.

F ·7 × ·45, *lob* ·1, *c* $\frac{1}{2\,5}$; *f*^{la} ·55 × ·65; *br* ·7; *br*^{la} ·65 × ·4^{mm}.

Rufo-viridis fragilis, in plagas latas densas prostrata. Caules 1–2-pollicares vage vel subpinnatim ramosi.

Folia paululum imbricata divergentia subrhomboideo-oblonga rotundata vel subtruncata, basi antica semicordata, postica minute sinuato-complicata; lobulus folio 7-plo brevior, saccatus, margine transverso, plica angulum 45°–50° cum caule efformante; cellulæ fere majusculæ subconformes, æquilateræ, pellucidæ, annulo chlorophylli latiusculo, pariete ad angulos sæpeque ad media latera incrassato.

Foliola subcontigua, foliis fere æquimagna sed oblata, cordato-reniformia vix ad $\frac{1}{2}$ bifida, rima angusta, segmentis apiculatis contiguis vel forficatis.

Flores dioici: ♀ terminales, innovatione suffulti. Bracteæ foliis æquilongæ complicato-bilobæ, lobis acutis, antico ovali, postico longe minore lanceolato; bracteola obovata ad $\frac{1}{2}$ fere anguste bifida, segmentis subacuminatis.

SUBGENUS XXIX.—*EUOSMO-LEJEUNEA*, S.

Plantæ elatiusculæ, tegeticulas latas densas ambitu sæpe pendulas efficientes, albescentes, odore Rosæ rubiginosæ jucundo scatentes, in sicco flavidæ rufescentesve, perianthiis insigniter rufis. Caules tenues laxe pinnatim ramosi, interdum subsimplices apiceque fere sine limite evoluti.

Folia mediocria (·5–·85, rarissime 1·0^{mm} longa) subimbricata, raro conferta, devexa vel subplana late semicordato-oblonga rotundata, rarissime subacuta—in unica subapiculata—sublævissima integerrimaque vel sæpius celluloso-asperula-crenulataque, lobulo parvo folio 4–8-plo breviore inflato; cellulæ mediocres vel parvæ ($\frac{1}{2\,5}$—$\frac{1}{5\,5}$^{mm} diametro) planæ vel obtuse prominulæ guttulatæ, pariete incrassato, trigonis maximis.

Foliola foliis subæquimagna, solum in *E. L. laxiuscula* sat (interdum ad duplum) minora, cordato-reniformia-orbiculatave, breviter (ad $\frac{1}{10}$–$\frac{1}{3}$) —raro ad $\frac{1}{2}$ usque—bifida.

Flores omnium fere dioici: ♀ terminales, innovatione (raro prolifera) suffulti. Bracteæ pro more foliis subbreviores, lobis sæpe angustis acutis integerrimis crenulatisve raro falcatis; bracteola subduplo longior quam lata bidentata, solum in *E. L. longiflora* orbiculata, in nulla integra.

Perianthia emersa, duplo longiora quam lata, subpyriformia rostellata, parum compressa, alte 5-carinata; sublævissima vel ad carinas aspera.

Amenta ♂ varie posita, bracteis pauci—multi-jugis majusculis turgidis subinæquilobis diandris.

Hab. In truncis vetustis putrescentibusve, in foliis emortuis et filicibus, ad fruticum pedem ramulosque, raro in saxis vel in ipsa terra arenosa, planitiei silvas diligentes, parum supra montes scandentes.

Distr. Species 6 Amazonicæ, quarum 5 novæ videntur (speciebus autem antea descriptis difficiliter extricandis) omnes in planitie vigent, earumque 2 etiam in Andibus orientalibus, vix ad alt. 1000^{m} usque, ascendunt;

in Andium declivibus occidentalibus nullam vidi.—Aliæ 10, vel plures, ab auctoribus descriptæ, pleræque neotropicæ, sc. *L. coronalis* G., *L. opaca* G., *L. amœna* G., *L. elegans* G., *L. vermicularis* Ldnbg., etc. etc.; una etiam (si rite huc relata) *L. rufescens* Ldnbg. insulam frigidam australem, *Staatenland*, habitat. Paucæ paleotropicæ sunt, quarum *L. trifaria* N. ab amazonica *L. longiflora* Tayl. vix diversa videtur. Hæc ultima hominis vestigia sequitur, fereque pro stirpe triviali habenda est.

A. *Monoicæ.*

1. *Euosmo-L. longiflora.* F. divergentia oblonga rotundata repanda, lobulo 4-plo breviore. Foliola foliis æquimagna cordato-reniformia ad $\frac{1}{5}$–$\frac{1}{3}$ bifida. Bracteola cordato-suborbiculata brevissime bifida. Per. pyriformi-oblonga argute 5-carinata lævia.

[*Euosmo-L. trifaria* N. A pr. differt statura minore; f. lobulo minuto; foliolis basi solum subcordatis; bracteola obovata.—*Java.*]

B. *Dioicæ.*

a. *Foliola apice bidentula.*

2. *Euosmo-L. fragrantissima.* F. ovato-oblonga obtusa raro subacuta crenulata apiceque interdum denticulata, lobulo 8-plo breviore. Foliola foliis æquimagna cordato-reniformia apice ad $\frac{1}{10}$–$\frac{1}{8}$ fissa. Bracteola elliptica ad $\frac{1}{4}$ bifida. Per. oblonga alte 5-carinata, carinis tuberculosis.

b. *Foliola ad $\frac{1}{4}$–$\frac{1}{2}$ bifida.*

3. *Euosmo-L. laxiuscula.* F. oblongo-rotunda repandula abrupte sinuato-complicata, lobulo 4-plo breviore. Foliola sat breviora cordato-orbiculata, ad $\frac{1}{4}$–$\frac{1}{3}$ bifida, segmentis patulis acutis. Bracteola longe oblonga ad $\frac{1}{4}$ bifida.
4. *Euosmo-L. suavcolens.* F. suborbiculata basi cordata, lobulo 4-plo breviore. Foliola fere æquimagna cordato-orbiculata angulata ad $\frac{1}{3}$ bifida, segmentis erectis acuminulatis. Bracteola elliptica ad $\frac{1}{3}$ bifida.
5. *Euosmo-L. subcrenulata.* F. ovato-rotunda subcrenulata, lobulo 5-plo breviore. Foliola vix minora reniformi-rotunda ad $\frac{1}{2}$ fere bifida, segmentis subacuminatis.
6. *Euosmo-L. comans.* Caules longissimi capilliformes. F. ovato-oblonga apiculata repanda facie papulosa; lobulo fere 4-plo breviore. Foliola paulo minora late cordato-oblonga angulata, apice ad $\frac{1}{4}$ bifida.

1. EUOSMO-LEJEUNEA LONGIFLORA, Tayl!

Lond. Journ. Bot. 1846, p. 396.—G. L. et N. Syn. Hep. 763.

Hab. Caripi aliisque locis prope *Pará*, in truncis vetustis; fl. *Negro*, circa *S. Gabriel*, ad ramulos, rarius ad truncos, in "caatingas"; *S. Carlos*, in *Crescentiæ Cujete* ramis; *Tarapoto*, Andium Peruv., ad rivulorum saxa, supra *Macromitrium* repens.

F ·65×·45; *lob* ·15; *c* $\frac{1}{4\,6}$; f^{la} ·6×·75, ·55×·65; ·4×·6; *br* ·5–·6; br^{la} ·55×·55; *per* ·9×·45^{mm}.

Repens pendulave substratificata albescens, siccando flavescens fusciduave, odore *Jung. bicrenatæ* aromatico scatens. Caules 1–4-pollicares

intricati pinnati v. subbipinnati, ramis inæqualibus pro more distantibus.

Folia subplana decurvave plus minus imbricata, a plica basali brevi suberectâ divergentia, oblique semicordato-oblonga rotundata, antice caulem transeuntia, celluloso-repanda; lobulus 4-plo brevior obtriangularis (cum lobi basi sacculum compresso-obconicum efformans), margine transverso incurvo, apice brevi 1–2-dentato; cellulæ parvulæ guttulatæ pellucidæ v. subopacæ, pariete incrassato trigonis maximis, parum prominulæ.

Foliola maxima, folia æquantia majorave, imbricata cordato-reniformia-orbiculatave, concava, apice breviter (ad $\frac{1}{5}$–$\frac{1}{4}$ solum, raro ad $\frac{1}{3}$ usque) bifida, sinu angusto latioreve, segmentis apiculato-acutis, repanda.

Flores monoici: ♀ ad ramum abbreviatum innovando-proliferum terminales. Bracteæ foliis subminores complicatæ, lobo ovali-lanceolato acuto obtusove, lobulo longe minore apice brevi lanceolato ligulatove; bracteola suborbiculata concava, apice rima perbrevi angustaque bifida, segmentis apiculato-acutis.

Perianthia semiemersa sæpe rufescentia pyriformi-oblonga, apice rotundato-truncato rostellata, 5-carinata—alia (in eadem planta) minora, alia majora—carinis tam argutis ut 5-alata viderentur. Calyptra pyriformis rufa, basi purpurascens.

Andrœcia cauligena, sæpe crebra, folium collaterale subsuperantia; bracteæ sub 5-jugæ turgidæ subinæqualiter bilobæ.

Var. *rupicola*, foliis prælate cordato-ovalibus fornicatis, celluloso-erosulis angulatisque; foliolis maximis duplo latioribus quam longis solum ad $\frac{1}{6}$ fissis; perianthiis brevibus.—Plantæ raro monoicæ, sæpius unisexuales præcipue masculæ.—In rupibus ad fl. *Negro* cataractas.

L. longiflora a *L. trifaria* Nees! (ex ipso in herb. Hook.)—stirps Javanica—parum (et vix specifice?) distat, statura elatiore; lobulis submajoribus; foliolis magis profunde cordatis; bracteolis suborbiculatis.—*L. coronalis* Gotts. (ex ins. Antillis) foliolis rotundo-quadratis—nec cordato-reniformibus—certe differre videtur.—Altera species Tayloriana, nempe *L. repens* T., l. c., a *L. longiflora* ægre separanda est.

Obs. Of Taylor's *L. longiflora*, I have part of the original specimen, given me by himself, and marked (by the collector) "Hab. Trees. Parà. Collected March 1841. T. L. R." Taylor's geography was therefore in error when to the published description, he appended the locality "Cincinnati in Prov. Ohio." (Lond. Journ. Bot. et Syn. Hep., ll. cc.)

2. EUOSMO-LEJEUNEA FRAGRANTISSIMA, Spruce.

Hab. In fluvii *Negro* sylvis, ad rivulum *Tarumá* super *Hymenophylli* frondes, ad *San Carlos* in truncis putridis; in cacumine montis "Cerro Pelado" dicti (alt. 800^{m}) prope *Tarapoto* Andium Peruvianorum, ad frutices necnon in ipsa terra inter *Selaginellas;* in sylva *Canelos* Andium Quit. supra *Plagiochilam cristatam* repens.

F ·85 × ·6, ·8 × 5, *lob* ·1, *c* $\frac{1}{40}$; *f*^{la} ·6 × ·85, ·55 × ·75; *br. lob* ·8 × ·4; *br*^{la} ·65 × ·5; *per* ·9–1·0 × ·55^{mm}.

Elata albescens, ad folia novella interdum rubescens, siccando flavida,

cæspitoso-erecta vel procumbens, *odore Rosæ rubiginosæ insigni scatens.* Caules 3–4-pollicares crassiusculi, cellulis 3–5-stratis conflati, paralleli, ope radicellarum inter se arcte adhærentes, apice elongato indefinite evoluti, basi marcescentes, parum ramosi, interdum subpinnati, ramis brevibus.

Folia subimbricata fere longitudinaliter inserta, angulo recto vel subdivergente patula, oblique semicordato-ovato-oblonga, apice decurvo obtusa rotundatave, rarissime subacuta et obtuse denticulata, facie e cellulis prominulis papuloso-scabra, margine crenulata, basi minute sinuato-inflexa; lobulus folio 8-plo brevior triangularis incurvus apice subexplanatus; cellulæ parvulæ suboblongatæ guttulatæ convexulæ, pariete incrassato, trigonis magnis, chlorophyllo in annulum subopacum congesto.

Foliola imbricata—raro solum contigua—foliis æquimagna cordato-reniformia (long. vix = $\frac{3}{4}$ lat.) apice ad $\frac{1}{10}$–$\frac{1}{8}$ alt. solum fissa, rima angusta, segmentis acutis, margine (laterali præcipue) late incurva.

Flores dioici: ♀ in ramulo terminales, innovatione recte continua sæpe iterum prolifera suffulti. Bracteæ foliis æquilongæ angustiores profunde bilobæ complicatæ, lobo semioblongo-obovatove, lobulo duplo breviore anguste ligulato obtuso; bracteola elliptica vel obovato-cuneata ad $\frac{1}{4}$ bifida, segmentis oblique acuminatis acutis.

Perianthia foliis paulo majora, a basi obpyramidata oblonga compressula rotundato-retusa, brevissime rostellata, alte 5-carinata, carinis suberosis tuberculosisve, demum basi elongata quasi-stipitata, clavato-oblonga, carinis prælatis, ore subtrifido. Calyptra vix brevior ovalis rufa.

Andrœcia cylindracea, totum ramulum vel sæpius ejus apicem solum tenentia; bracteæ 5–10-jugæ diandræ.

Var. *condensata*, foliis arcte (ad $\frac{1}{2}$ lat.) imbricatis valde convexo-decurvis, utraque facie papulosis; foliolis prælate cordato-reniformibus, fere lunatis, e basi profunde excisa utrinque decurrentibus.—Andes Peruviæ, in M. *Campana* ad folia emortua; in M. *Guayrapurina* cum *Mastigobryis* consociata.

3. EUOSMO-LEJEUNEA LAXIUSCULA, Spruce.

Hab. Caripi, prope *Pará*, in cortice.

F ·5 × ·4, *lob* ·125, *c* $\frac{1}{50}$; *fv^a* ·3 × ·3, ·35 × ·35, ·3 × ·35; *br* ·75; *br^la* ·55 × ·35^mm.

Albicans, in sicco flavida, prostrata, matteolas laxiusculas sistens. Caules 1–2-pollicares flexuosi subramosi, raro subpinnati bipinnative.

Folia subimbricata, a basi complicatâ semierectâ abrupte divergentia, apice decurva, semicordato-oblongo-rotunda, celluloso-repandula, facie subpapulosa, ad lobuli apicem valde sinuata; lobulus folio 4-plo brevior, subovatus saccatus, apice incurvo acuto; cellulæ parvæ subopacæ guttulatæ, intus ovali-rotundæ, trigonis conspicuis.

Foliola foliis dimidio saltem breviora, subimbricata, cordato-orbiculata, subinde paulo latiora quam longa, ad $\frac{1}{4}$–$\frac{1}{3}$ acute bifida, segmentis patulis acutis.

Flores dioici: ♀ in ramo brevi terminales, innovatione suffulti. Bracteæ foliis longiores, falcato-incurvæ, ovali-ellipticæ, plerumque obtusæ, ad $\frac{1}{4}$ alt. bilobæ, lobulo angusto apice lanceolato; bracteola oblonga, duplo fere longior quam lata, contorta, breviter bifida, segmentis acutis erectis forficatisve.

Perianthia (juvenilia) pyriformia, argute 5-carinata.

Obs. Ad *S. Gabriel* fluvii *Negro* formam in *Plagiochila* reptantem legi, foliis (·45 × ·4^{mm}) rotundioribus, lobulo adempto suborbiculatis vel cordato-orbiculatis; foliolis (·3 × ·35^{mm}) paulo ultra $\frac{1}{4}$ bifidis, sinu triangulari.

Ab *Euosmo-L. longiflora* T. certe differt flor. dioica, foliis rotundioribus; foliolis distincte minoribus magis profunde fissis; bracteola angusta (nec orbiculata). *L. elegans* Gottsch. Syn. Hep. 364, diversa erit "foliolis arcte imbricatis, transverse rotundis" (nec cordatis), *foliis subæquimagnis;* cæteris caracteribus autem a nostra parum recedit.

4. EUOSMO-LEJEUNEA SUAVEOLENS, Spruce.

Hab. In sylva Amazonica ad *Caripi* prope *Pará*, in palmarum truncis; in Andibus Peruv. inferioribus circa *Tarapoto* et *Lamas*, ad fruticum radices ramulosque.

F ·65 × ·65, ·5 × ·5; *lob* ·1–·125; *c* $\frac{1}{50}$–$\frac{1}{45}$; *f*^{la} ·55 × ·65, ·5 × ·6, ·4 × ·4; *br* ·7; *br*^{la} ·65^{mm}.

Albescens, siccando flavida olivaceave, opaca pellucidave, prostrata. Caules 1–2-pollicares, in tegeticulam latam texti, filiformes, debiles, subpinnati, ramis paucis brevibus inæquilongis.

Folia subimbricata tenuia, plana vel apice subdecurva, ad plicam subrecta, angulum 30°–45° cum caule efformantia, supra plicam fere divergentia, orbiculata—raro subovata—utrinque cordata (antice ad ipsam basin, caulem late transeuntia, postice ad lobuli apicem), integerrima; lobulus parvus folio 4–6-plo brevior ovatus triangularisve brevi-acutus inflatus; cellulæ parvæ conformes subæquilateræ guttulatæ, convexulæ, ad angulos insigniter incrassatæ, annulo angusto opaco cinctæ.

Foliola foliis fere æquimagna subimbricata, cordato-orbiculata, concava subangulata, apice ad $\frac{1}{3}$ bifida, segmentis contiguis v. parum dissitis acutis acuminulatisve, interdum subcarinata.

Flores dioici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis subæquilongæ oblique oblongæ obovatæve rotundatæ raro acutæ, lobulo duplo v. ultra breviore anguste rhomboideo acuto; bracteola elliptica ad $\frac{1}{3}$ bifida, segmentis obtusis apiculatisve. Perianthia . . . .

Amenta ♂ ovata v. oblongata, ramulum totum v. ejus basin solam tenentia; bracteæ 5- (raro pluri-) jugæ majusculæ magnæve turgidæ.

L. clausa Mont. et N. (Syn. Hep. 365) folia habet obtusa, "sinu leni complicata;" amphigastria solum contigua (nec imbricata) ad $\frac{1}{2}$ fissa. De foliolis insigniter cordatis pl. nostræ nihil l. c. dicitur.—*L. opaca* Gottsche (Syn. H. 362) a *L. clausa* haud diversa videretur.

Although I found plants of both sexes, I saw no fruit. The male plants at Tarapoto were 15 miles away from the females at Lamas, and 2000 miles from those of Caripi—either distance far too great to allow of impregnation; and if plants of either sex occurred in the intermediate spaces, I did not fall in with them.

5. EUOSMO-LEJEUNEA SUBCRENULATA, Spruce.

Hab. S. Gabriel, in cortice, cum *Cerato-Lejeunea Cubensi.*

F ·65 × ·6, ·65 × ·55, *lob* ·125; *c* $\frac{1}{3-5}$; *f*^{la} ·55 × ·7, ·45 × ·6^{mm}.

Late reptans, intricata, pallida dein rufula, tenella. Caules sesquipollicares parum et subpinnatim ramosi.

Folia ad $\frac{1}{3}$ late imbricata, horizontaliter patula, assurgentia, apice decurva, semicordato-ovato-rotunda oblongave, repanda, celluloso-subcrenulata, supra lobulum abrupte devexo-rotundata; lobulus 5-plo brevior parum decurrens, trigono-ovoideus brevissime apiculatus, inflatus; cellulæ mediocres subconformes, ad angulos incrassatæ, guttulatæ, subpellucidæ, annulo chlorophylli laxo angusto, perpaulo prominulæ.

Foliola foliis sæpe vix minora, oblata tamen, subreniformi-rotunda, subundulata, subcrenulata, ad medium fere biloba, sinu triangulari obtuso, segmentis subacuminatis acutis, basi paulo decurrentia (nec cordata), margine repanda crenulataque.

Fl. dioici: ♂ terminales (imperfecti); bracteæ paucijugæ, ovoideo-cymbiformes.

6. EUOSMO ?-LEJEUNEA COMANS, Spruce.

Hab. S. Carlos del Rio Negro, in sylvis humilioribus, ad arborum radices, præcipueque e ramulis foliisque plagulis latis dependens.

F ·55 × ·4, *lob* ·15, *c* $\frac{1}{4-5}$–$\frac{1}{4-6}$; *f*^{la} ·4 × ·35^{mm}.

Albicans, siccando flavescens; caules 6-pollicares et longiores, capillacei, tenaces tamen et opaci, flexuosi, subsimplices vel parum ramosi, ramis elongatis cum caule pendulis.

Folia perpaulo imbricata, angulo 60° patentia, rigidiuscula, fornicato-decurva breviter ovato-oblonga, basi semicordata caulem tegentia, apice abrupte et plerumque apiculato-acuta, celluloso-crenulata, complicata, plica recte decurrente; lobulus folio 4-plo fere brevior ovato-rhomboideus inflatus, margine incurvo, apice acuto; cellulæ subparvæ parum elongatæ guttulatæ convexulæ subopacæ, granis chlorophylli plerumque sparsis.

Foliola foliis paulo minora, imbricata, subappressa, late oblonga, basi profunde cordata, subundulata, margine angulata, apice vix ad $\frac{1}{3}$ bifida, rima angusta, segmentis acutis, rarissime radicellifera.

Flores . . . .

Planta formosa dubiæ affinitatis ad *L. longifloram* Tayl. paulo accedens; forsan melius cum *L. duriuscula* e. a. inter *Cheilo-Lejeuneas* collocanda. *L. vermicularis* Lindenb., "caule elongato filiformi, foliis deflexo-convolutis" nostræ sat similis, differt foliis orbiculatis haud acutis, lobulo apice subuliformi, et foliolis rotundis, nec cordatis. (Syn. Hep. 367.)

SUBGENUS XXX.—*PYCNO-LEJEUNEA*, S.

Plantæ majusculæ prostratæ arcte repentes albescentes, teneræ pellucidissimæ subramosæ, ramis inæquilongis.

Folia arctissime imbricata decurvo-concava late semicordato-oblonga sæpius rotundata, lobulo v. mediocri inflato v. prælongo et in cylindrum convoluto, papuloso-scabra integerrima, interdum ocellata; cellulæ subparvæ lepto-v. pachydermes facie alte prominulæ.

Foliola subduplo breviora, latiora quam longa, reniformia, ad vel ultra $\frac{1}{3}$ bifida, sinu lato segmentisque acutis.

Flores monoici vel dioici: ♀ terminales, innovatione simplice v. iterum innovata suffulti. Bracteæ foliis longiores incurvo-conniventes complicato-bilobæ, lobis subinæqualibus acutis acuminulatisve, integerrimæ, interdum ad carinam alatæ; bracteola lata bidentata v. integra.

Perianthia emersa obovato-pyriformia turgida vix compressula brevirostria argute 5-carinata sublævissima. Calyptra rufa. Capsula globosa magna.

Androecia ramigena, sæpius terminalia; bracteæ pauci-plurijugæ majusculæ.

Obs. Affinitatem habet cum *Euosmo-Lejeunea*, ex odore leniter suavi et foliolis majusculis, longe diversa tamen habitu, foliis confertissimis pellucidissimis etc.; etiam cum *Trachy-Lejeunea* e foliis papillosis interdum ocellatis, a qua distat foliis prælatis confertissimis, foliolis multo majoribus, perianthiis lævibus, etc. *Cheilo-Lejeunca* statura minore, cellulis obscuris (e chlorophylli annulo opaco) et perianthiis compressis demum bilabiatis magis remota est.

Hab. In sylvis planitierum densis, ad arborum corticem, interdum alias hepaticas infestans.

Distr. Subgeneris mere tropici ipse solum 2 species legi, sc. *L. contigua* Nees, jam antea in Mexico, Brasilia et Guiana (imo in ins. Mascarenis ?) lecta, et *L. macroloba* Mont. (a qua vix differt *L. callosa* Ldnbg.) e Guiana allata. Aliæ paucæ species, sc. *L. Hampeana* Ldnbg., *L. inflata* N. etc. neotropicæ sunt; *L. trapezia* N. e Java habemus.

1. *Pycno-L. contigua.* Monoica. Folia ocellata papulosa, lobulo 4-plo breviore ovato inflato. Foliola segmentis acutis. Bracteæ lobo subobtuso, cum bracteola integra bidentulave basi connatæ.
2. *Pycno-L. macroloba.* Dioica. Folia exocellata prælte papulosa, lobulo paulo breviore in cylindrum convoluto. Foliola segmentis apiculatis. Bracteæ ad carinam alatæ, lobis acuminulatis; bracteola libera breviter bifida.

1. PYCNO-LEJEUNEA CONTIGUA, Nees.

In Mart. Fl. Bras. I., p. 360. G. L. et N. Syn. H. 362.

Hab. Fl. Amazonum, prope *Pará*, *Santarem* et *Obidos*, necnon ad fl. *Negro* cataractas, in cortice.

F ·63×·5, *lob* ·15–·2; *c* $\frac{1}{4\,5}$; f^{la} ·25×·35; *br* ·8–·45; br^{la} ·7×·5; *per* ·75×·45^{mm}.

Albescens, pellucidissima, plagas circumscriptas iis *Radulæ complanatæ* similes efficiens. Caules $\frac{1}{2}$–1-pollicares, inæqualiter pinnatim ramosi, matrici arcte adhærentes, implexi, ramis æquifoliatis, raro plus minus microphyllis.

Folia arctissime imbricata, assurgentia, insigniter fornicato-concava (margine toto incurvulo), late semicordato-oblonga—alia paulo latiora quam longa—sæpe subrhombea, angulis rotundatis, repandula, facie papulosa margine postico sinuato-complicata; lobulus folio 4-plo brevior anguste ovatus inflatus, apice acuto sæpe involuto; cellulæ parvulæ æquilateræ pellucidæ, 4–10 basin versus duplo majoribus vacuis, vel sparsis vel in maculam collectis, ocellatæ, omnes (marginalibus exceptis) papuloso-prominulæ, leptodermes, granis chlorophylli (oleiferisque, elongatis sæpe flexuosis) cellulæ ambitu, vel hic illic,

sparsis.—Folia caulina minus imbricata, ramea tamen valde conferta.

Foliola imbricata foliis $2\frac{1}{2}$-plo—in var. vix 2-plo—minora, oblato-rotunda v. subreniformia, fere ad $\frac{1}{2}$ biloba, sinu lato triangulari segmentisque acutis.

Flores monoici: ♀ in ramo sæpe brevi terminales, innovatione simplice suffulti. Bracteæ foliis longiores subpatulæ incurvo-conniventes, complicato-bilobæ, lobo oblique oblongo subobtuso, lobulo subbreviore lanceolato lingulatove acuto, cum bracteola obovato-spatulata integra vel sæpius emarginato-bidentula, dentibus conniventibus, basi coalitæ.

Perianthia subemersa vel immersa obovato-pyriformia, vix compressa, brevissime rostellata, apicem versus argute 5-carinata sublævissima, fructu emerso turgida, carinis fere obliteratis, apice 4-fida; e calyptra rufa inclusa flavida videntur, apice tamen scariosa et quasi vitrea. Calyptra magna perianthium fere implens, sessilis, pyriformis apice valvatim 4-fida, valvulis inæquilatis acuminulatis, anticâ sublatiore stylo persistente coronatâ. Capsula magna globosa ad $\frac{3}{4}$ usque in valvulas 4 lanceolatas fissa.

Andrœcia in ramis brevibus interdum parvifoliis terminalia, vel ramulo solo constantia, ovoidea; bracteæ sub 4-jugæ, sat magnæ, turgidæ.

Var. *latifolia*. *F* ·75 × ·8, *lob* ·125; f^{la} ·4 × ·6^{mm}.—Major, robustior. Caules bipollicares, aliis ramis superne attenuatis, aliis tota longitudine microphyllis. Folia majora, oblata, fere reniformia, rarius ocellata; lobulus contra minor, folio 6-plo brevior. Foliola dimidium folium subexcedentia, margine subangulata, segmentis apiculatis acuminulatisve. Bracteola apice ad $\frac{1}{6}$–$\frac{1}{3}$ fissa (in flore sterili).—Plantæ persæpe unisexuales.—*Caripi* propre *Pará*, in cortice.

Var. *parvula*, rigidula, folii lobulo longiore.—*Santarem* et *San Carlos*.

Obs. Pycno-L. contigua foliis confertissimis inter *Lejeuneas Schizostipas* fere unica est, solumque cum *L. macroloba* et affinibus conjungi potest.

2. PYCNO-LEJEUNEA MACROLOBA, Mont.

Ann. des Sc. Nat. 1843, p. 260. G. L. et N. Syn. Hep. 359.

Hab. Ad fl. *Negro* et *Uaupés*, in cortice ramulisque, sæpe aliis hepaticis irrepens.

F 1·05 × ·8, ·8 × ·65, ·75 × ·6; *lob*. 55; *c* $\frac{1}{3\,5}$—$\frac{1}{4\,5}$; f^{la} ·5 × ·65, ·4 × ·6; *br* 1·1 × ·85; br^{la} 1·1 × ·9, ·9 × ·9; *per* 1·05 × ·55^{mm}.

Repens, dense stratificata vel sparsa, albicans, siccando interdum fuscescens. Caules validi 1–2-pollicares inordinatim ramosi, sæpe iteratim innovandi monotropi.

Folia tenera arctissime imbricata divergentia late semicordato-oblongaovatave apice decurvo rotundata obtusatave, margine postico ultra medium v. fere ad apicem usque in lobulum cylindricum (explicatum lato-linearem) apice in folium oblique vel sensim transeuntem convoluta—carinâ interdum bis implicatâ—facie papuloso-scabra; cellulæ parvulæ pellucidæ æquilateræ subconformes, extus in conum obtusum alte prominulæ.

Foliola imbricata foliis æquilata sed duplo breviora, reniformi-rotunda, basi subcordata, apice ad $\frac{1}{3}$–$\frac{1}{2}$ acute late bifida, segmentis apiculato-acutis incurvulis; subfloralia majora minus profunde fissa.

Flores dioici: ♀ in ramo sæpe iteratim prolifero terminales. Bracteæ foliis subæquilongæ incurvo-cucullatæ ad ⅓ bilobæ, ad carinam alatæ, lobis oblongis vel semiovalibus acuminulatis, raro obtusis, postico minore; bracteola ovato-rotunda vel fere orbiculata, apice breviter bifida, segmentis apiculatis incurvis.

Perianthia bracteas haud superantia pyriformia parum compressa brevirostria, alte 5-carinata, carinis subpapulosis, e calyptra rufa inclusa rufescentia, revera albida apice scariosa.

Andrœcia in planta tenuiore longioreque; bracteæ plurijugæ majusculæ inæqualiter complicato-bilobæ inflatæ, vel ramum totum vel ejus majorem partem tenentes.

Forma typica ad fl. *Uaupés* et riv. *Cauapuna* crescit. Var. *exalata*: foliolis undulato-crispis, utrinque supra medium angulatis, obtuse unidentatis vel etiam sublobulatis; bracteis ad carinam exalatis.—Juxta *S. Carlos* et *S. Gabriel*.

SUBGENUS XXXI.—*POTAMO-LEJEUNEA*, S.

Euosmo-Lejeuneæ habitu staturaque sat similis, diversa autem colore lurido; odoris absentia; foliis margine postico cum plica fere recte continuo (nec ad plicæ apicem valide sinuato), lobulo majusculo subplano (nec minuto turgido), foliolis solum ½ folium æquantibus (nec sæpissime subæquimagnis), basi haud cordatis.—Flores ♀ in ramo brevi terminales, innovatione simplice (in unica specie nulla) suffulti. Perianthia apice sæpius vel truncata vel carinis valde rotundo-prominulis.

Potamo-L. temnantha, habitu, colore lurido, et perianthiis truncatis ad *Cerato-Lejeuneam* transitum præbet, certe tamen distincta utriculorum defectu, foliorum lobulo planiore, et cellulis pachydermibus ambitu late opacis.—Inter Cheilo-Lejeuneas militaverit, præcipue quoad *P. L. polystachyam*, ramulis ♀ simplicissimis *Cheilo-Lejeuneis* plurimis conformem, nisi perianthia alte 5-carinata, haud bilabiata, obstavissent.

Hab. et *Distr.* Constat subgenus speciebus solum 3, ad truncos fluviorum *Negro* et *Uaupés* irrigatos a me lectis. Forsan *L. Coarina* G., ad fl. Amazonum superius inventa, in 'Syn. Hep.' ad Ceratanthas adscripta, quarta species constituerit; pro tempore eandem inter *Cerato-Lejeuneas* collocavi.

A. *Ramulus* ♀ *simplex, innovatione nulla.*

1. *P.-L. polystachya.* Monoica, robusta, ramulis ♂ et ♀ sæpe arcte pinnulata. F. semioblonga-ovatave rotundata, lobulo plus duplo breviore subrectangulari; cellulæ leptodermes. Foliola vix=folii dimidium, late obovata ad ⅓ bifida. Br. erecto-incurvæ falcatæ, lobo oblongo rotundato; bracteola ligulato-oblonga, brevissime bifida. Per. pyriformi-oblonga, carinis lateralibus posticisque altis apice rotundo-prominulis.

B. *Ramulus* ♀ *innovatione auctus.*

2. *P.-L. temnantha.* Monoica, subpinnata fragilissima. F. late patentia subfalcata oblique oblonga rotundata, lobulo 4-plo breviore rhombeo subinflato v. fere plano; cellulæ parvulæ intus late opacæ, pariete incrassato. Foliola fere 2-plo breviora oblongo-rotunda ad ½ bifida. Br. acutæ; bracteola ovata breviter bifida. Per. turbinato-oblonga apice quadrato-truncata. Andr. longispica.

3. *P.-L. riparia.* Dioica, a pr. differt lobulo majore planiore; cellulis subpellucidis; foliolis orbiculatis, segmentis subacuminatis; br. lobo obtuso; bracteola magna ovali apice brevissime bidentula subdenticulata; per. obovato apice rotundato; andr. brevispicis.

1. POTAMO-LEJEUNEA POLYSTACHYA, Spruce.

Hab. Ad arborum radices ab aquis fluvii *Uaupés* cataractarum irrigatas.

F ·75 × ·5; *lob* ·3 × ·125; *c* $\frac{1}{15}$; *f*^{la} ·35 × ·35; *br* ·65; *br*^{la} ·6 × ·2; *per* ·9 × ·6; *andrœcia* 1·0–2·0; *br* ♂ ·3^{mm}.

Robusta luride purpurea, in plagas magnas densas diffusa. Caules 1½–2-pollicares subrecti paralleli stratificatique, basi parum divisi, deinde longe simplices sæpeve ramulis floriferis, ♂ et ♀, crebre pinnulati.

Folia contigua vel subimbricata, raro dissita, late semioblonga vel subovata apice plus minus decurvo rotundata, a basi ultra ⅓ recte complicata; lobulus plus duplo brevior subrectangularis planiusculus, rarius inflatus, sinu lato, apice subacuto rotundatove; cellulæ parvæ subconformes subplanæ, annulo chlorophylli lato opaco circumdatæ, centro pellucidæ.

Foliola dimidium folium fere æquantia, paulo dissita, late obovata, ad ⅓ bifida, sinu segmentisque abrupte acutis.

Flores monoici, ramulis brevibus constantes. Ramulus ♀ sub 4-phyllus simplicissimus (innovatione nulla). Bracteæ foliis caulinis breviores erecto-incurvæ, vix ad ½ bilobæ, lobo falcato-oblongo ligulatove rotundato, lobulo duplo breviore angustioreque linguæformi acuto obtusove; bracteola fragilis ligulato-oblonga apice cucullato brevissime (vix ad ⅓) bifida, segmentis abrupte acutis obtusisve.

Perianthia emersa pyriformi-oblonga, apice depresso obsolete rostellata, subcompressa, antice depressa apice carinulata, postice argute bicarinata, carinis glaberrimis. Calyptra subæquilonga sed angustior, rufula fusiformis.

Amenta ♂ ramulum julaceum, folium caulinum 2–3-plo superantem sistentia; bracteæ 5–10-jugæ, parvulæ, cymbiformi-complicatæ, bifidæ, lobis ovatis, inferiore paulo minore acutioreque; bracteolæ oblongæ emarginato-bifidæ.

Obs. E ramis ♀ simplicibus melius forsan cum Cheilo-Lejeuneis militaverit, diversa autem habitu robusto et perianthiis haud compresso-bilabiatis.

2. POTAMO-LEJEUNEA TEMNANTHA, Spruce.

Hab. Saō Gabriel, in truncis fl. *Negro* inundatis.

F ·75 × ·5; *lob* ·2; *c* $\frac{1}{40}$; *f*^{la} ·4 × ·35; *br* ·6; *per* ·7 × ·4^{mm}.

Majuscula, luride purpurascens siccando fere nigra, fragilissima, late effusa. Caules 1½-pollicares, inæqualiter subpinnati, prostrati.

Folia parum imbricata, angulo 80° patentia, oblique oblonga subfalcata, apice decurvo rotundata subtruncatave repandula, recte complicata; lobulus 4-plo brevior subrhombeus inflatus raro subplanus obtusus, interdum obsoletus; cellulæ parvulæ subconvexæ pariete ad angulos valde incrassato, annulo opaco lato cinctæ, inferiores majores subelongatæ.

Foliola vix duplo breviora dissita oblongo-rotunda ad ½ usque acute bifida, segmentis acutis obtusisve.

Flores monoici: ♀ in ramulo abbreviato terminales, innovatione simplice

(rarissime iterum prolifera) subtensi. Bracteæ foliis minores, lobis planis subacutis, majore elliptico-lanceolato, minore diagonali ligulato-lanceolato æquilongo breviore ve; bracteola ovata breviter bifida: omnes integerrimæ.

Perianthia f. caulino subæquilonga, subturbinato-oblonga urceolatave brevi-rostellata compressa, postice bicarinata, antice depressa carinulata, apice truncata, carinis celluloso-papulosis apice lato insigniter quadratis.

Andrœcia ramulis tenuibus julaceis 6-polyphyllis constantia.

E colore lurido, perianthiis truncatis (non autem cornutis), ad *Cerato-Lejeuneam* certe accedit. *Cerato-L. Coarinæ* G. in Syn. Hep. 305, subaffinis, distinctissima tamen videtur.

3. POTAMO-LEJEUNEA RIPARIA, Spruce.

Hab. In fluvii *Negro* superioris ripis, ad truncos riparios inundatos.

F ·7 × ·5, ·5 × ·35; *lob* ·3 × ·15; *c* $\frac{1}{50}$—$\frac{1}{45}$; f^{la} ·35 × ·35, ·3 × ·3; *br* ·65; br^{la} ·65 × ·5; *per* ·7 × ·5^{mm}.

Rufo-lurida, prostrata, laxe stratificata; caules pollicares rectiusculi perpaulo ramosi, ramis pro more brevibus.

Folia subplana parum imbricata, a basi fere ad medium usque complicata, plicâ rectâ angulum sub 80° cum caule formante, supra plicam subdivergentia, subfalcata, oblique late oblonga rotundata repandula integerrima; lobulus $\frac{1}{2}$ folii subæquans subrectangularis vel semi-ovato-rhomboideus parum inflatus, sinu subexciso, apice acuto sæpeque in dentem producto; cellulæ parvulæ subguttulatæ limitibus latis trigonisque pellucidis, nucleo pellucido, granis chlorophyllicis subsparsis raro in annulum rufulum aggregatis: facie fere planæ vel convexulæ.

Foliola subdissita, $\frac{1}{2}$ folium æquantia, suborbiculata, paulo ultra $\frac{1}{3}$ acute bifida, lobis acutis sæpe subacuminatis.

Fl. dioici: ♀ in ramo breviusculo terminales, innovatione brevi simplice parvifolia suffulti. Bracteæ foliis vix æquilongæ, ad $\frac{3}{4}$ bifidæ complicatæ, lobo ovali obtuso, lobulo lanceolato acuto sæpe lobum fere æquante; bracteola magna ovalis acuta, apice ad $\frac{1}{10}$—$\frac{1}{8}$ bifida, segmentis acutis plerumque tam contiguis ut bracteola integra videretur raro revera integra, superne angulata v. etiam paucidenticulata.

Perianthia parum emersa obovata, apice rotundato brevi-rostellata, *sat compressa*, antice carinulata, postice bicarinata, carinis omnibus celluloso-subcrenulatis. 4-keeled

Amenta ♂, in pl. propria, vel ramulum proprium vel rami apicem tenentia; bracteæ 4–5-jugæ majusculæ, cochleato-complicatæ, apice brevissime et fere æqualiter bifidæ, subimbricatæ.

L. temnantha, huic omnium proxima, differt flor. monoicis; lobulis foliis 4-plo brevioribus; perianthiis apice tetragono-truncatis, &c.

L. polystachya fl. monoicis, ♀ innovatione carentibus, ♂ amentis ad caulem creberrimis, perianthio lævissimo, carinis apice rotundo-prominulis, &c., differt.

SUBGENUS XXXII.—*CHEILO-LEJEUNEA*, S.

Plantæ humiliores, raro pusillæ, nunquam robustæ, dense depresso-cæspitosæ, recentes albidæ, virescentes, flavidæ vel sæpius rufulæ, in sicco

plerumque luride rufescentes, perianthio insigniter rufo, calyptra aurantiaca. Caules prostrati, in aliis speciebus rarius, in aliis fere constanter, ramulis microphyllis pinnulati; cæterum vage ramosi vel subpinnati, ramis sæpe assurgentibus.

Folia subimbricata, nunquam conferta, supra plicam fere semper subfalcata, patentissima divergentiave, ambitu plus minus semicordato-oblonga, rotundata, rarius obtusa, integerrima vei rarius cellulosocrenulata, sæpius papulosa, lobulo turgido 3–4-plo breviore, nunquam obsoleto; cellulæ parvulæ, raro fere minutæ, convexo-prominulæ, ambitu e chlorophyllo late opacæ, pariete ad angulos præcipue pellucido.

Foliola folii $\frac{1}{4}$–$\frac{1}{2}$ æquantia, subrotunda, ad medium usque bifida, segmentis acutis, integerrima angulatave.

Flores monoici vel dioici. Rami ♀ in plerisque breves longioresve simplicissimi, nunquam innovantes; in paucis innovatione simplice (raro prolifera) aucti. Bracteæ liberæ distiche divergentes falcatæ concavæ (parum complicatæ) integerrimæ, ad $\frac{1}{2}$ bilobæ, lobo fere semper rotundato, lobulo multo angustiore acuto; bracteola anguste subovalis breviter bifida sæpeve integra.

Perianthia late pyriformia sat compressa 4–5-carinata, carinis posticis pro more humilibus demum obsoletis vel in unam latam fere confluentibus, ore bilabiatim rupta, rostello brevi vel plane nullo.

Andrœcia varie posita—haud raro in ipso caule v. in ramo primario terminalia—brevia longiorave; bracteis majusculis turgidis.

Hab. In arborum præcipue ripariarum cortice, raro in truncis prostratis, nunquam in foliis vivis, haud raro autem supra muscos reptantes; per planitiem sylvaticam ubique obviæ, in montibus semel visæ.

Distr. Ad fl. Amazonum ejusque tributarios (præcipue boreales) 10 species inveni (8 ? novas); quarum unica in Andes Peruvianos humiliores ad 1200^{m} ascendit. Aliæ species, jam antea descriptæ, omnes (ut videtur) neotropicæ sunt, a Mexico ad Brasiliam vigentes, in Antillis rariores, quarum nominare liceat *L. confluens* Ldnbg., *L. xanthophylla* Ldnbg., *L. adnata* Kze., *L. parvistipula* L. et G., *L. Magnoliæ* L. et G. ? *L. Melastomatis* L. et G., ? *L. lurida* Ldnbg.—*L. duriuscula* Nees, e Guiana, et *L. phyllobola* Mont. ex ins. Cuba, etiam in sylva Amazonica legi.

A. *Flores* ♀ *innovatione nulla suffulti.* (§ HAPLOCLADA).

a. *Monoicæ.*

1. *Cheilo-L. aneogyna.* Albida flavescensve subramosa, aliis ramis sæpe microphyllis. F. subimbricata divergentia subfalcata semiovato-oblonga rotundato-truncata, lobulo 4–5-plo minore inflato, cellulis parvis subplanis. Foliola f. 4–5-plo minora ad $\frac{1}{2}$ bifida. Ramus ♀ brevissimus v. elongatus, simplex. Br. foliis majores, lobo obtuso; bracteola ovali-ligulata bidentula integrave. Per. obcordato-turbinata compressa postice obtuse bicarinata, demum fere lævia apiceque bivalvia. Andr. varie posita, bracteis 4–6-jugis.
2. *Cheilo-L. roseo-alba.* A pr. distincta statura majore, ramis sæpe elongatis neque microphyllis; f. semicordato-oblongis, lobulo $\frac{1}{2}$ folium fere æquante planiusculo; foliolis duplo majoribus; bracteola anguste oblonga bifida; perianthiis pyriformibus longirostribus.

b. *Dioicæ.*

b_1. *Foliola foliis subduplo minora.*

3. *Cheilo-L. Panurensis.* Majuscula lurido-viridis prostrata. F. confertiuscula subdivergenti-falcata oblonga rotundata papulosa, lobulo 4-plo breviore inflato. Foliola $\frac{1}{3}$ folio longiora rhombeo-rotunda fere ad $\frac{1}{2}$ bifida. Andr. medio caule posita.
4. *Cheilo-L. assurgens.* Pusilla pallida rufulave, caule prostrato, ramis assurgentibus breviusculis. F. subimbricata patentissima falcata oblique oblonga rotundata sublævia, margine postico concavo ad plicam tamen recto et subhorizontali, lobulo prioris. Foliola f. duplo breviora subrotunda ad $\frac{1}{2}$ bifida, superiora submajora sæpe angulata. Br. ♀ f. fere duplo longiores, ad $\frac{2}{3}$ bifidæ: bracteola obovato-lanceolata ad $\frac{1}{3}$ bifida. Per. . . .
5. *Cheilo-L. heteroclada.* Grandiuscula albida et rufo-badia tenera prostrata vage ramosa sæpeque ramulis microphyllis pinnulata bipinnulatave. F. imbricata decurva late semicordato-ovata rotundata obtusatave, subrecte complicata, lobulo 3-plo breviore inflato, cellulis parvulis subelongatis. Foliola plus duplo breviora oblato-rotunda fere ad $\frac{1}{2}$ bifida, superiora submajora ad $\frac{1}{4}$–$\frac{1}{3}$ fissa. Br. foliis fere $\frac{1}{2}$ longiores, lobo rotundato; bracteola elliptica breviter bifida raro integra. Per. emersa rotundo-pyriformia suberostria sat compressa postice altiuscule bicarinata.

b_2. *Foliola foliis* 3–4*-plo minora.*

6. *Cheilo-L. decidua.* Mediocris, olivaceo-rufa, vage ramosa, ramis ex parte denudatis. F. decidua subimbricata subfalcata oblique oblonga rotundata sinuato-complicata, lobulo 3–5-plo breviore decurrente saccato. Foliola distantia suborbiculata fere ad $\frac{1}{3}$ acute bifida. Br. foliis minores, lobo rotundato; bracteola oblongo-lanceolata apice cucullato bidentata. Per. emersa obcordato-pyriformia submutica postice obtuse bicarinata demum fere lævia.
7. *Cheilo-Lejeunea papulosa.* Pusilla subrufa cæspitosa, ramis assurgenti-secundis sæpe parvifoliis. F. imbricata subplana falcato-divergentia oblique oblonga rotundata insigniter papulosa margineque crenulata subrecte complicata, lobulo 3-plo breviore inflato. Foliola fere prioris. Br. foliis fere duplo majores, lobis vix complicatis acutis; bracteola obovato-lanceolata ad $\frac{1}{3}$ bifida.

B. *Flores* ♀ *innovatione suffulti.* (§ NEOCLADA).

a. *Monoicæ.*

8. *Cheilo-L.-nanodes.* Minutula cæspitosa vage ramosa. F. imbricata concava fere semicircularia abrupte acuta obtusave subpapulosa recte complicata, lobulo subduplo breviore inflato, cellulis fere minutis. Foliola folio 4-plo breviora rotunda vix ad $\frac{1}{3}$ bifida. Br. foliis fere duplo majores complicato-concavæ breviter bilobæ, lobo rotundato; bracteola ovali-lanceolata ad $\frac{1}{3}$ bifida. Per. vix emersa late pyriformia subcompressa, antice carinulata, postice 2-carinata. Andr. terminalia brevia, bracteis 3-jugis.

b. *Dioicæ.*

9. *Cheilo-L. phyllobola.* Pusilla rufula dense cæspitosa, caule subpinnatim ramoso, ramisque sæpe subdenudatis, ramulis raro microphyllis.

F. fragilia subimbricata subdivergentia, semicordato-subrotunda repanda subrecte complicata, cellulis minutulis. Foliola plus duplo breviore late ovalia repandula, vix ad $\frac{1}{3}$ bifida. Br. foliis multo majores; bracteola oblonga brevissime bifida. Per. subemersa late pyriformia valde compressa, carinis posticis demum obliteratis. Andr. varie posita, bracteis 5-jugis.

10. *Cheilo-Lejeunea duriuscula.* Pr. similis, robustior, sordide flavida. F. subimbricata patula fornicata semicordato-oblonga angulata sinuato-complicata, lobulo 4–5-plo breviore turgido, cellulis subparvis. Foliola f. 2–3-plo breviora, superiora increscentia, late ovalia fere ad $\frac{1}{2}$ bifida. Br. foliis vix longiores; bracteola oblonga ad $\frac{1}{4}$–$\frac{1}{2}$ bifida. Per. late pyriformia compressa, carinis lateralibus posticisque altis. Andr. terminalia, bracteis 3-jugis.

1. CHEILO-LEJEUNEA ANEOGYNA, Spruce.

Hab. Ad fl. *Negro*, *Uaupés* et *Casiquiari*, sat frequens in cortice vetusto.

F ·6 × ·45, ·55 × ·4; *lob* ·1–·13; *c* $\frac{1}{40}$—$\frac{1}{45}$; *f*^{la} ·15 × ·125, ·125 × ·125; *br* ·6–·7; *br*^{la} ·4 × ·15; *per* ·8 × ·55, ·65 × ·5^{mm}.

Albida, pallide viridis flavescensve, arcte adrepens et in stratum tenue effusa. Caules $\frac{1}{2}$–1-pollicares tenues flaccidi, vel paralleli pauciramei, vel intricate ramosi, aliis ramis sæpe microphyllis.

Folia subimbricata divergentia, sæpe subfalcata, late dimidiato-ovato-oblonga, rotundato-truncata, v. subrotunda, repandula, subrecte complicata; lobulus folio 4–5-plo brevior ovato-rhomboideus inflatus, margine incurvo, apice truncato-acuto; cellulæ parvulæ subplanæ, ambitu late opacæ, pariete ad angulos incrassato.

Foliola distantia, subrotunda v. rhombeo-rotunda, foliis 4–5-plo minora (superiora tamen increscentia) ad $\frac{1}{2}$ usque acute bifidæ, segmentis subacutis.

Flores monoici: ♀ in ramo brevissimo longioreve—raro in ipso caule—terminales, sine ulla innovatione. Bracteæ foliis submajores distiche patulæ decurvæ profunde bilobæ, lobo semiovali obtusato raro subacuto, lobulo parvo lineari subulatove; bracteola longe brevior ovali-ligulata apice bidentata vel integra obtusataque.

Perianthia subemersa rotundo-vel sæpius obcordato-turbinata brevissime rostellata, sat compressa, antice convexula, postice obtuse bicarinata v. sæpissime carinis in unam latam subconfluentibus, lævibus vel subpapulosis, demum bilabiata, labio postico interdum fisso. Calyptra parva perianthio duplo brevior, demum apice 3-loba.

Andrœcia in ipso caule vel in ramo terminalia, raro ramulum lateralem sistentia, linearia; bracteæ 4–8-jugæ laxiusculæ ventricoso-saccatæ, f. caulinis duplo breviores.

Var. *subsessilis*, caule sæpe subsimplice, andrœciis fere constanter in caulis apice positis, floribus ♀ ramulo brevissimo constantibus.—*S. Gabriel. Riv. Cauapuna.*

Var. *macroclada*, caule ramosiore, andrœciis ramigenis, floribus ♀ in ramo plus minus elongato terminalibus.—*S. Gabriel. Fl. Uaupés et Casiquiari.*

2. CHEILO-LEJEUNEA ROSEO-ALBA, Spruce.

Hab. In sylva Amazonica, ad fl. *Caipurâ*, in palmarum truncis.

F ·8 × ·55, ·7 × ·5, *lob* ·3 × ·1, *c* $\frac{1}{40}$; *f*^{la} ·35 × ·35; *br*^{la} ·5 × ·2; *per* ·75 × ·5, 5 × ·3^{mm}.

Prostrata sæpeque in orbem supra matricem radiata, albo-viridis, in ambitu interdum roseo tincta. Caules semipollicares vage ramosi implexi, ramis valde inæquilongis, aliis flexuosis polyphyllis, raro apice, rarissime tota longitudine, attenuatis parvifoliisque.

Folia subimbricata, angulo recto divergentia, oblique subsemicordato-oblonga, apice decurvulo rotundata vel subtruncata, a basi ad medium fere usque complicata; lobulus lineari-rhomboideus, margine paulo incurvo, sinu exciso, apice acuto; cellulæ parvulæ, ambitu late opacæ, centro pellucidæ, inferiores sensim majores.

Foliola dissita, dimidio folio paulo minora, orbiculata, ad medium fere bifida, sinu lato triangulari segmentisque acutis.

Flores monoici: ♀ in ramulo, sæpe brevissimo diphyllo, nunquam innovante, terminales. Bracteæ foliis dimidio minores, ultra medium bilobæ, lobo acinaciformi-oblongo rotundato incurvulo, lobulo linearilinguæformi acuto; bracteola lanceolato-oblonga breviter (ad $\frac{1}{10}$–$\frac{1}{4}$) emarginato-bifida.

Perianthia paulo emersa, pyriformia *longirostria* compressa, antice convexa, postice convexa et supra medium bicarinulata, demum (fructu magno repleta) turgida lævissima, capsulâ emissâ, bilabiata, labio postico raro apice fisso.

Androecia varie posita, vel in medio caule ramove, vel in ramuli basi apiceve; bracteæ foliis consecutivæ, vix minores, 4–6-jugæ turgidæ.

A *Cheilo-L. aneogyna* distat statura majore; foliis submajoribus basi cordatis; lobuli foliolaque 2-plo vel fere 3-plo longioribus; ramis ♀ semper brevissimis; perianthiis longirostribus.

L. leucophylla Lindenb. (Syn. Hep. 369) differt foliis subrotundis; foliolis foliis 3–4-plo minoribus; perianthiis acute 5-angulis.

L. contigua Nees, subaffinis, distincta est foliis confertissimis et perianthiis subæqualiter 5-carinatis, necnon ramis ♀ proliferis.

3. CHEILO-LEJEUNEA PANURENSIS, Spruce.

Hab. Panuré, fl. *Uaupés*, in truncis prostratis.

F ·65 × ·4, *lob* ·15; *c* $\frac{1}{45}$–$\frac{1}{40}$; f^{la} ·35 × ·35^{mm}.

Lurido-viridis, prostrata. Caules 1–2-pollicares, parum ramosi; alii rami ex p. parvifolii.

Folia $\frac{1}{4}$–$\frac{1}{2}$ lat. imbricata—inferiora interdum conferta—basi (ad lobuli apicem usque) fere horizontalia parum ascendentia, dein divergentia, subfalcato-oblonga, antice semicordata, facie papulosa, margine repanda subcrenulata, apice subfornicata vel fere plana; lobulus plus 4-plo brevior convoluto-inflatus ovoideo-oblongus acutus; cellulæ parvulæ, ad angulos incrassatæ, intus sinuatæ annulo opaco latiusculo cinctæ, subconformes, guttulatæ, convexo-prominulæ.

Foliola vix duplo minora, imbricata, rhombeo-rotunda, fere ad $\frac{1}{2}$ bifida, sinu segmentisque subacutis.

Fl. dioici: ♀ . . . .

Androecia in medio caule ramove posita; bracteæ sub 4-jugæ majusculæ turgidæ.

Foliis majoribus, magis elongatis, papulosis, et foliolis majoribus imbricatis, a *L. heteroclada* S. differt.

4. CHEILO-LEJEUNEA ASSURGENS, Spruce.

Hab. San Carlos del Rio Negro, in cortice.

F ·4×·3, *lob* ·1, *c* $\frac{1}{50}$; *br* ·75, *br*^{la} ·55×·25; *f*^{la} ·2×·2, ·2×·25^{mm}.

Pusilla pallescens rufulave depresso-cæspitosa; caules $\frac{1}{4}$–$\frac{1}{2}$ pollicares prostrati, inæqualiter subbipinnati, ramis assurgentibus pro more brevibus paucifoliis, aliis parvifoliis.

Folia perpaulo imbricata patentissima falcata oblique oblonga rotundata, basi anticâ aliquando semicordata, margine postico concava ab apice ad lobuli sinum usque, dein complicata, plicâ rectâ et vel horizontali vel parum decurrente; lobulus folio 4-plo brevior rhomboideus incurvo-inflatus (exinde subovoideus), margine apiceque (subacuto) plerumque conspicuis; cellulæ parvæ medio pellucidæ ambitu opacæ, *guttulatæ*, subelongatæ, paucæ suprabasales nonnunquam (nec semper) duplo longiores quam latæ, omnes subplanæ.

Foliola dissita, foliis duplo breviora, subrotunda, ad medium usque bifida, sinu subobtuso depresso, segmentis acutis, superiora (versus fl. ♀) submajora sæpeque angulata.

Fl. dioici: ♀ in ramo brevi longioreve terminales. Bracteæ distichæ falcato-patulæ, foliis fere duplo longiores, obovato-oblongæ rotundæ, ad $\frac{2}{3}$ bifidæ (nec semper complicatæ), lobulo lineari linguæformive subacuto; bracteola obovato-lanceolata ad $\frac{1}{3}$ bifida, segmentis contiguis subacutis, sæpe in fl. sterili convolutiva.

Perianthia . . . .

L. papulosa differt foliis margine postico recto v. subconvexo, facie margineque papulosis, lobulo submajore saccato; foliolis duplo minoribus, etc.

5. CHEILO-LEJEUNEA HETEROCLADA, Spruce.

Hab. Ad fl. Negro juxta *S. Gabriel*, *S. Carlos*, etc., etiam ad fl. *Caipurú* fluvio *Trombetas* affluentem, in truncis præcipue inundatis.

F ·55×·45, *lob* ·15–·2, *c* $\frac{1}{3-5}$; *f*^{la} ·2×·25, ·25×·3, ·28×·34; *br* ·75; *br*^{la} ·6×·35; *per* ·7×·5; *amenta* ♂ ·6×·45^{mm}.

Grandiuscula, albida et rufo-badia tenera; caules bipollicares radicellis fasciatis arcte adrepentes, vage ramosi sæpeque ramulis microphyllis pinnati et bipinnulati.

Folia subimbricata (ad $\frac{1}{2}$—rarissime ad $\frac{1}{4}$ lat. usque), decurva, obscure falcata, late semicordato-ovata rotundata—raro solum oblique obtusa—repanda, subrecte complicata; lobulus sub 3-plo brevior ovato-rhomboideus, inflatus acutus; cellulæ parvulæ paulo elongatæ convexulæ subconformes, intus flexuosæ, ambitu late opacæ, pariete ad angulos subincrassato.

Foliola inferiora subdissita foliis fere 3-plo breviora oblato-rotunda subangulata ad $\frac{1}{2}$ fere bifida, superiora vix 2-plo breviora ad $\frac{1}{3}$–$\frac{1}{4}$ solum bifida, segmentis subacutis.

Flores dioici: ♀ terminales in ramo brevissimo—raro longiore vel in caulis ipso apice, innovatione nulla suffulti. Bracteæ foliis dimidio fere longiores, patentissimæ vel falcato-divergentes ligulato-oblongæ-obovatæve obtusæ vel rotundatæ, vix ad $\frac{1}{2}$ bifidæ, lobulo ligulato duplo fere angustiore apice lanceolato subacuto; bracteola elliptica subplana ad $\frac{1}{3}$ bifida—in fl. fertili brevissime bifida, interdum integra—segmentis contiguis acutis.

Perianthia foliis duplo fere longiora, late pyriformia—interdum subrotunda—erostria, sat compressa, antice carinulata, postice altiuscule bicarinata sublævissima.

Androecia ovato-oblonga, vel ramulo toto vel ejus apice solo constantia; bracteæ 3–5-jugæ majusculæ turgidæ subæquilobæ.

Var. *subandina* Spruce.—In M. *Campana*, alt. 1200^{m}, ad cortices; etiam super *Cerro Pelado*, alt. 600^{m}, in saxis.

F ·6 × ·5, ·5 × ·4; *lob* ·1–·125; *c* $\frac{1}{50}$; f^{la} ·25 × ·35, ·3 × ·38; *per* ·8 (1·2) × ·55^{mm}.

Caules bipinnati, ramis inæquilongis, plurimis microphyllis. Folia subdivergentia semicordato-ovato-rotunda, lobulo 5-plo fere breviore interdum breviapiculato; cellulæ folii marginem versus multo minores. Foliola ad $\frac{1}{3}$ bifida, sinu segmentisque obtusis. Perianthia rufa, alte carinata, demum elongata et quasi-stipitata, bilabiata. Calyptra perianthio sat brevior, pyriformis.—Forsan pro specie propria habenda.

6. CHEILO-LEJEUNEA DECIDUA, Spruce.

Hab. Ad fluvium *Caipurâ*, fl. *Trombetas* affluentem, flum. Amazonum tributarium, in cortice.

F ·7 × ·5, ·45 × ·35, *lob* ·125, *c* $\frac{1}{35}$; f^{la} ·15 × ·18; *br* ·5–·6; br^{la} ·5 × ·25; *per* ·75 × ·5; *caps* ·3^{mm}.

Mediocris, ex olivaceo-viridi subrufa. Caules pollicares prostrati flexuosi rigidiusculi (viminei) vage ramosi, ramis assurgentibus flexuosis, sæpe e foliis deciduissimis plus minus denudatis.

Folia paulo (ad $\frac{1}{4}$ lat.) imbricata decurvula parum falcata, oblique oblonga rotundata, basi antica ampliata non autem semicordata, postica sinuato-complicata; lobulus folio 3–5-plo brevior triqueter saccatus, ad plicam rectus (f. rameorum tamen semiovatus inflatus, plicâ subconvexâ), apice acuto sæpius occulto; cellulæ mediocres æquilaterali-hexagonæ, ambitu late opacæ, pariete ad angulos incrassato, folii marginem anticum apicemque versus multo minores. Folia ramea sæpissime decidua, vel eorum lobulo solo persistente.

Foliola distantia, foliis 3–4-plo minora, suborbiculata, ad $\frac{1}{2}$ fere bifida, sinu segmentisque acutis.

Flores dioici: ♀ in ramulo brevissimo cauligeno terminales, innovatione nulla suffulti. Bracteæ foliis minores subfalcato-patulæ semioblongæ rotundatæ, ad $\frac{1}{2}$ long. bifidæ, complicatæ vel non, lobulo lineari-lanceolato-acuto; bracteola oblongo-obovatove-lanceolata, apice brevissime fisso rotundata sæpeque cucullata.

Perianthia foliis caulinis sublongiora, flavida, opaca, fragilia, obcordato-pyriformia-cuneatave valde compressa, mutica vel solum minute umbonulata, antice subdepressa, postice obtuse bicarinata, fructu egresso turgida, carinis fere obliteratis, ore bilabiata. Calyptra duplo fere brevior rufa sessilis pyriformis. Capsula globosa haud alte emersa.

Cheilo-L. phyllobola, foliis deciduis nostræ analoga, ramo fœmineo innovato, etc. longe distat. *L. lurida* Lindenb. (Syn. Hep. 379) pluribus notis conformis, differt foliolis obovatis profunde bifidis, præcipueque florescentia monoica. *L. heteroclada* S. aliis ramis microphyllis; foliis persistentibus brevioribus late semicordato-ovatis; foliolis superioribus multo majoribus breviter fissis; bracteis magnis; perianthiis postice altiuscule bicarinatis, distincta est.

7. CHEILO-LEJEUNEA PAPULOSA, Spruce.

Hab. Manáos, ad fl. *Negro* ostia, in cortice.

F ·35 × ·25, *lob* ·12, *c* $\frac{1}{50}$; f^{la} ·08 × ·08, ·1 × ·1^{mm}.

Pusilla subrufa cæspitosa. Caules $\frac{1}{4}$-pollicares prostrati subpinnatim ramosi, ramis assurgenti-secundis, pluribus plus minus parvifoliis fragilibusque.

Folia imbricata subfalcato-divergentia subplana oblique oblonga rotundata celluloso-crenulata subrecte complicata; lobulus 3-plo brevior ovato-rhombeus inflatus subsaccatus, apice incurvulo acuto; cellulæ parvæ opacæ—solum centro pellucidæ—papuloso-prominulæ scaberulæque, pariete subincrassato.

Foliola distantia, foliis 4-plo minora, orbiculata, ad medium usque bifida, segmentis subacutis.

Flores dioici: ♀ in ramo pro more brevi terminales—sæpe ramulo hinc vel utrinque, distante tamen neque bracteæ adnato, suffulti. Bracteæ (fl. sterilis) foliis duplo fere majores, divergentes, apice incurvo-cucullatæ, fere ad $\frac{1}{2}$ bifidæ, lobulis vix complicatis conniventibus acutis, postico multo angustiore, bracteola obovato-lanceolata ad $\frac{1}{3}$ bifida.

Obs. What seem to be innovations are not such, for they are not adnate to the bracts, and indeed arise from the outer base of the leaves next below the bracts. They are either solitary (unilateral) or a pair (opposite), and sometimes are altogether wanting.

8. CHEILO-LEJEUNEA NANODES, Spruce.

Hab. Santarem, fl. Amazonum, in cortice.

F ·25 × ·18, *lob* ·1–·125; *c* $\frac{1}{6\,5}$; f^{la} ·07 × ·07; *br. l.* ·4 × ·25; br^{la} ·35 × ·18; *per* ·4 × ·3^{mm}.

Pusilla—fere minuta—badia depresso-cæspitosa. Caules $\frac{1}{4}$-pollicares vage ramosi, ramis arcuatis, sæpe superne sensim parvifoliis.

Folia imbricata assurgentia concava semiovata v. fere semicircularia abrupte acuta obtusave, raro rotundata, repandula, facie subpapulosa, recte complicata; lobulus $\frac{1}{2}$ folio fere æquilongus subtransversus, inflatus oblongo-ovoideus, margine interno latiusculo quasi-truncato, apice brevi-dentiformi; cellulæ subminutæ, subconvexulæ, intus annulo opaco cinctæ, parietibus perpaulo incrassatis.

Foliola minuta foliis fere 4-plo brevior rotunda vix ad $\frac{1}{2}$ bifida, segmentis subacutis.

Flores monoici (rari): ♀ in ramo terminales, innovatione interdum prolifero suffulti. Bracteæ foliis fere 2-plo minores, distiche patulæ, vix decurvæ, concavæ complicatæ breviter bilobæ, lobo oblique obovato subrotundato, lobulo angusto lineari acuto; bracteola ovali-lanceolata, ad $\frac{1}{2}$ bifida, segmentis subacutis.

Perianthia bracteis æquilonga, luride rufa, late pyriformia, brevi-rostellata, subcompressa, antice apice carinulata, postice 2-carinata, carinis sublævissimis, demum bilabiata.

Androecia ramum terminantia; bracteæ 3-jugæ foliis æquimagnæ turgidæ subæquilobæ.

A *L. phyllobola* et *duriuscula* certe differt floresc. monoica cæterisque

caracteribus; a *L. parvistipula* L. et G. (e Mexico) caule foliisque duplo fere minoribus, foliis subdimidiatis sæpe acutis, bracteis obtusissimis.

L. discoidea L. et L.! (ex ins. S. Vincentis, hb. Hook.) nostra statura pusilla etc. sat similis, differt foliis dimidiato-ovato-oblongis, lobulo folio 4-plo minore, cellulis solum parvis; foliolis ½ folium æquantibus ad ⅓-solum bifidis; demum perianthio turbinato-globoso argute 5-carinato.—

L. myriantha N. et M. (e Guiana Gallica) folia habet orbiculata toto fere longitudine complicata; foliola submajora breviter fissa, et perianthia obcordata acute pentagona.

9. CHEILO-LEJEUNEA PHYLLOBOLA, Mont.

Hab. Ad fl. Amazonum, in cortice, minus frequens quam *L. duriuscula*.

F ·35 × ·25, 35 × ·3, ·38 × ·35; *lob* ·1; *c* $\frac{1}{55}$–$\frac{1}{60}$; (*f*^{la} ·15 × ·125;) *br* ·6; *br*^{la} ·55 × ·33; *per* ·7 × ·4; *andr* ·65^{mm}.

Pusilla pallide rufula, dense depresso-cæspitosa. Caules subpollicares vage v. subpinnatim ramosi, flexuosi, sæpe foliorum lobis majoribus deciduis subdenudati, ramulis raro microphyllis.

Folia fragilia quasi-vitrea apice subscariosa, parum imbricata, subdivergentia sæpeque assurgenti-recurvula, subsemicordata, rotunda vel late oblonga et rotundata, celluloso-repanda, subrecte complicata; lobulus vix 4-plo brevior ovatus subsaccatus apice brevi incurvo; cellulæ minutulæ subconformes pulchre guttulatæ, centro ovali-globosæ pellucidæ, annulo opaco eadem forma vel leniter 6-sinuato in peripheria, pariete pellucido ad angulos incrassato.

Foliola dissita, foliis plus duplo breviora, late ovalia v. rhombeo-rotunda, vix ad ½ usque acute bifida, repandula, segmentis patulis obtusis, acutis v. subapiculatis.

Flores dioici: fl. ♀ in ramo brevi, vel in ipso caule, terminales, innovatione (sæpe proliferâ) suffulti. Bracteæ foliis multo majores late distiche patulæ, vix ad ½ complicato-bilobæ, lobo semiovali obtusato, lobulo multo angustiore lineari v. rhomboideo; bracteola oblonga solum ad ¼ (in fl. sterili ad ¼) emarginato-bifida, sinu segmentisque subacutis.

Perianthia foliis caulinis duplo longiora assurgenti-recurva rufula late pyriformia valde compressa, antice 1-carinulata postice bicarinata, carinis posticis humilibus demum fere obliteratis, fructu egresso bilabiata, rostellata, lævissima. Calyptra rufa, perianthio subbrevior.

Amenta ♂ sæpius in rami apice terminalia, quin etiam medio caule proveniunt, turgide spicata folio caulino subduplo longiora; bracteæ 5-jugæ majusculæ cymbiformi-complicatæ ultra medium bifidæ, segmentis obtusatis erosulis.

Var. *turgidula* S., paulo robustior, foliis submajoribus vix unquam caducis, lobulo submajore; bracteis (altera saltem) acutis; bracteola ad ⅓ v. fere ad ½ bifida, segmentis subacuminatis; perianthio viridi turgescenti-pyriformi, primum compresso et humiliter 4–5-gono, demum inflato fere tereti, post capsulam emersam raro bilabiato, apice autem 3–5-valvi.—*Hab.* prope *Pará*.

10. CHEILO-LEJEUNEA DURIUSCULA, Nees.

in Syn. Hep. p. 364.

Hab. In sylva Amazonica, præcipue versus fluminis ostia, ad *Pará*,

Caripí, etc., ad fluvios *Aripecurú* et *Caipurú* fl. *Trombetas* affluentes, in cortice, sæpe *Plagiochilas* et muscos infestans; ad fl. *Negro* rarius. Etiam in Guiana (CURIE; LEPRIEUR).

F ·6 × ·4, ·45 × ·38; *lob* ·125; *c* $\frac{1}{4\cdot5}$; *f*^{la} 3 × ·25, ·2 × ·2; *br* ·5–·6; *brla* ·5 × ·35; *per* ·8 × ·5^{mm}.

Pallide sordide viridis flavidave, siccando sæpe subrufa badiave, parum odorata, in tegeticulas latas densas prostrata. Caules 1–1½-pollicares flexuosi rigiduli, subpinnatim ramosi, ramis sparsis inæquilongis, aliis (vel in toto vel ex parte) parvifoliis.

Folia subimbricata patula fornicato-decurva suboblique semicordato-oblonga subrotundave, rotundata, angulata vix obscure crenulata, sinuato-complicata; lobulus 4–5-plo brevior turgide ovatus, apice incurvo brevi acuto; cellulæ subparvæ, submarginales multo minores, subelongatæ (inferiores præcipue) guttulatæ convexulæ, pariete incrassato, medio pellucidæ, ambitu late opacæ.

Foliola dissita vel subcontigua, foliis 2–3-plo breviora, superiora sensim majora, late ovalia rotundave, fere ad ½ bifida sinu pro more angusto segmentisque acutis.

Flores dioici: ♀ in ramo terminales, innovatione (sæpe microphylla) suffulti. Bracteæ foliis subæquilongæ distichæ subfalcatæ oblique oblongæ rotundatæ—altera rarius acuta—ultra medium bilobæ, lobulo vario, angusto, sæpe lineari-ligulato; bracteola oblonga ovalisve convolutiva ad ¼–½ bifida, segmentis acutis incurvo-conniventibus.

Perianthia subemersa rufescentia late pyriformia at compressa, apice rotundato-truncato retusulove rostellata, 5-carinata, carinis posticis lateralibusque altis lævibus, demum bilabiata.

Andrœcia in planta propria ad ramos terminalia; bracteæ majusculæ sub 3-jugæ.

Planta e fl. *Aripecuru* bracteas habet longiores lanceolatas, alteram acutam acuminulatamve. Altera e fl. *Caipuru*, floribunda, foliis planioribus, bracteolæ segmentis obtusis, a typo parum discrepat.

SUBGENUS XXXIII.—*EU-LEJEUNEA*, S.

Plantæ mediocres vel pusillæ, tenellæ—nunquam magnæ nec robustæ—læte, pallide v. flavo-virides, albicantesve, raro subolivaceæ, nunquam (nisi raro ad perianthia) rufæ, siccando parum mutatæ flavidæve, strato tenui v. densiore late repentes, raro ex p. assurgentes. Caules tenuiusculi pro more pallidi fragiles, pinnati vel vagi, rarius ex parte dichotomi.

Folia majuscula parvave ·35–·9^{mm} (in plerisque ·5–·7^{mm}.) longa, paulo (nunquam dense) imbricata v. dissita, subplana, in paucis concava, basi plus minus dilatatâ longitudinalique inserta, ovata ovaliave, rarius subrotunda, raro basi semicordata, apice obtusa rotundatave, rarius acuta, vix unquam acuminata, integerrima v. in paucis e cellulis marginalibus prominulis subcrenulata, recte v. subsinuato-complicata, lobulo sæpe parvo, v. in sp. pusillis obsoleto, in perpaucis ½ folium æquante superanteve, inflato, in paucis subplano; cellulæ mediæ pro more mediocres ($\frac{1}{30}$–$\frac{1}{35}$^{mm}) rarius parvæ v. fere minutulæ, rarissime majusculæ, omnes subconformes, subplanæ, raro

papuloso-(nunquam conico-) prominulæ, leptodermes, trigonis perparvis nullisve, chlorophyllo parco.

Foliola foliis 2–3-plo—in sp. pusillis 4–7-plo—minora, raro majuscula, in nulla foliis ipsis æquimagna, subrotunda vel late ovalia, raro subangustiora, fere v. usque ad ½ bifida—in paucis sp. ad ¾ usque —laciniis ovatis lanceolatisve perraro subulatis, pro more subacutis, nunquam late obtusatis, integerrima v. rarissime utrinque 1-dentata. Haustoria fasciæ-vel scopæ-formia.

Flores in plurimis monoici, in paucis dioici: ♀ in ramo, raro in ipso caule, terminales, innovatione simplice, v. (aliarum specierum) proliferâ, suffulti, raro dichotomiales. Bracteæ foliis subæquilongæ, angustiores, suberectæ—nec decurvo-hamatæ nec distiche patentissimæ —integerrimæ, pro more lobulatæ, lobulo parvo, raro nullo; bracteola sæpissime libera, angusta—2–3-plo longior quam lata—in perpaucis fere tam lata quam longa—apice brevissime v. ad ½ bifida.

Perianthia ·35–1·1^{mm} longa, plerumque emersa, plus minus pyriformia obovatave, rostellata, paulo compressa—in perpaucis magis compressa apiceque obcordata, 5-carinata, carinis raro peracutis, in plerisque lævissimis, in paucis subtuberculosis.

Androecia persæpe ramulo tenui cauligeno constantia, rarius in ramo terminalia; bracteæ pauci-raro pluri-jugæ, parvæ, in paucis sp. majusculæ, in nulla foliis æquimagnæ, diandræ.

Hab., in zona tropica fere semper arborea, raro rupestris, sæpe in foliis vivis, palmarum præcipue, et in filicibus, haud in truncis putridis nisi supra alias hepaticas et muscos; in zonis temperatis autem persæpe rupestris, nunquam foliicola.

Distr. In America æquatoriali 30 species (plerasque novas) legi, quarum 11 *Megalostipas*, omnes montanas vel etiam subalpinas, in Andibus inter 1500 et 3500^{m} alt. crescentes, præter *Eu.-L. flava* Sw., species per totam planitiem sylvaticam dispersa, in Andibus nullibi ad 1500^{m} usque ascendens. *Microstipæ* erant 6 species, quarum 4 in planitie solum observavi, cæteræ 2 in Andium radicibus alt. 500^{m} vix attingentes; *Planilobæ* 7 species, quarum 2 in Andibus, ad alt. 2200^{m} usque, supra suffrutices vigebant; cæteræ solum in planitie, truncos vetustos et filices diligentes, earum una, *Eu-L. inundata* n. sp., cum ejus var. *fontinaloides*, ad arborum truncos ramosque fluviorum Negro et Uaupés irrigatos, sæpe barbam pendulam sistens, *Hydropogon fontinaloides* Hook. fluviorum vicinorum Casiquiari et Orinoco simulans. *Cardianthæ* speciebus sub 6 constabant, omnes in planitie Amazonica vigentes, una sola etiam in Andium radicibus vix supra 500^{m} alt. visa fuit.

Eu-L. serpyllifolia, cum varietatibus suis in hemisphæra boreali late dispersa, "cosmopolitana" ab auctoribus dicta, in America æquatoriali mihi nullibi obvia fuit. Specimina tropico-asiatica in herb. Hook. sub nom. *L. serpyllifoliæ* asservata, *L. flavæ* var. (=*L. thymifolia* N.) ex p. videntur. Species 3 v. 4, *L. serpyllifoliæ* arcte affines, in Europa et America boreali temperata crescunt, inclusa *L. flava*, extra tropicos solum ad Killarney Hiberniæ inventa.—Aliæ plurimæ *Eu-Lejeuneæ* in libris descriptæ sunt, maxima parte America tropica indigenæ, paucæ Africanæ, Indicæ, Malayanæ vel Australasicæ.

Subgenus in 4 sectiones, sequente modo distinguendas, dividendum:

* *Per. parum compressa distincte 5-carinata, apice rotundata retusa aut (neque obcordata).*

† *Folia lobulo inflato.*

§ 1. MEGALOSTIPÆ, *foliolis ½ folium subæquantibus, in paucis majoribus minoribusve, subrotundis, ad ⅓–½ bifidis.* Pl. sæpe elatiusculæ. F. rotundata obtusave, in perpaucis acuta.

§ 2. MICROSTIPÆ, *foliolis foliis 3–8-plo minoribus, sæpe subcuneatis, raro fere rotundis, semper ultra medium bifidis, in paucis fere bipartitis.* Pl. omnes pusillæ.

†† *Folia lobulo subplano apice sæpe subulato, interdum ad dentem planum fere redacto, in paucis obsoleto.*

§ 3. PLANILOBÆ. Pl. plurimæ pusillæ tenerrimæ, interdum elongatæ.

** *Per. sat compressa carinis 2 posticis humilibus carinulâ anticâ sæpe subnullâ, apice obcordata.*

§ 4. CARDIANTHÆ. Pl. pusillæ mediocresve. F. lobulo parvo nullove. Foliola parva, in unica sp. majuscula.

§ 1. MEGALOSTIPÆ.

A. *Fl. monoici.*

Folia rotundata obtusatave.

1. *Eu-L. megalostipa.* F. late semicordato ovata subpapulosa, lobulo magno ½ fol. excedente; c. $\frac{1}{60}$–$\frac{1}{50}$ mm diam. Foliola foliis paulo minora fere ad ½ bifida, segmentis subacutis. Bracteola bracteis subconnata ad ⅓ bifida. Per. subemersa obovato-pyriformia tenuirostria alte 5-carinata. Andr. polyphylla.
2. *Eu-L. cyathophora.* Pusilla. F. ovata rotundata raro subacuta, lobulo duplo breviore; c. $\frac{1}{32}$ mm. Foliola foliis vix duplo minora ad ⅓ bifida, segmentis subobtusis. Bracteola obovato-oblonga ad ½ bifida. Per. emersa obovata ecarinata, rostello turbinato insigni. Andr. oligophylla.

[*Eu-L. Sinclarii* Spruce MS. Majuscula albicans. F. subfornicata prælate ovata subsemicordata, apice varia, sæpe subacuta, raro rotundata, lobulo vix duplo breviore, cell. *L. flavæ.* Foliola f. duplo minora subcordato-ovali-rotunda ad ½ bifida, segmentis acutis. Bracteola lanceolata breviter bifida, basi utrinque connata. Per. alte emersa pyriformia, alte argute 5-carinata.—*N. Zelandia.*]

3. *Eu-L. leucophæa.* Elongata albescens. F. supra lobulum 4-plo breviorem divergentia, semicordato-oblonga, c. $\frac{1}{40}$ mm. Foliola paulo minora cordato-ovato-rotunda, vix ad ½ bifida, segmentis subacutis. Bracteola obovato-lanceolata vix ad ⅓ bifida. Per. alte emersa clavato-pyriformia brevi-latirostria compressula superne alte 5-carinata. Andr. minuta crebra.
4. *Eu-L. flava.* Majuscula, albicans flavidave. F. oblonga, rarius ovato-oblonga rotundata, lobulo 3–7-plo minore, c. parvulis. Foliola 2–3-plo minora, superiora increscentia, ad ⅓–½ bifida, segmentis acutis obtusisve. Bracteola cuneato-lanceolata obovatave, ad ⅓–½ bifida. Per. plus minus emersa pyriformia subcompressa 5-carinata, carinis humilibus subobtusis.

[*Eu-L. serpyllifolia* Dicks. F. obovata vel oblongo-rotunda, rotundata raro solum obtusa, lobulo sub 3-plo (raro solum 2-plo) minore, cell.

mediocribus. Foliola 2-3-plo breviora orbiculata ad $\frac{1}{3}$ bifida, segmentis acutis obtusisve. Bracteola cuneato-lanceolata ad $\frac{1}{3}$ bifida. Per. emersa obovata v. obovato-oblonga compressula acute 5-carinata.—*Zona temperata boreali.*]

5. *Eu-L. hebetata.* F. majuscula concava semicordato-ovata subpapulosa angulato-repanda, lobulo plus 5-plo breviore, c. mediocribus. Foliola plus duplo minora late ovata ultra $\frac{1}{2}$ bifida, segmentis obtusatis, margine recurvulo crenulato. Bracteola ovali-rotunda ultra $\frac{1}{2}$ bifida. Per. emersa pyriformi-oblonga subcompressa argute 5-carinata.
6. *Eu-L. leptalea.* Elongata tenuis pinnatim ramosa pellucidissima. Folia decurrentia ovato-oblonga obtusata, lobulo 3-plo breviore interdum apiculato, c. parvis, inferioribus autem duplo majoribus. Foliola 2–3-plo minora subrotunda ad $\frac{1}{2}$ bifida, segmentis subacutis. Bracteola ovalis breviter bifida. Per. alte emersa pyriformia humiliter 5-carinata.
7. *Eu-L. cochleata.* Subolivacea. F. subdissita late semicordato-ovata rotundata, raro obtusa, cochleato-concava, margine postico apiceque recurvula, lobulo vix 3-plo breviore, c. parvis subconformibus. Foliola fere 3-plo minora concava, fere ad $\frac{1}{3}$ bifida, segmentis obtusis. Bracteola oblonga vix ad $\frac{1}{4}$ bifida. Per. pyriformi-obovata alte argute 5-carinata.

b. *Folia omnia v. pleraque acuta.*

8. *Eu-L. flagellaris.* Elatior laxe bipinnata, ramis apice sæpe flagellaribus. F. concava late semicordato-ovata, superiora subapiculata, inferiora sæpe obtusata, lobulo 4-plo breviore, cellulis mediocribus. Foliola duplo breviora orbiculata vix ad $\frac{1}{3}$ bifida, segmentis acutis. Bracteola cuneato-lanceolata fere ad $\frac{1}{2}$ bifida. Per. alte emersa pyriformia alte 5-carinata.
9. *Eu-L. ramulosa.* Pusilla, ramulis microphyllis pinnata. F. dimidiato-ovata subacuminata, lobulo 6-plo breviore. Foliola $\frac{1}{2}$ folio longiora ad medium bifida, segmentis subacuminatis. Br. fere æquilobæ; bracteola subrotunda ultra $\frac{1}{2}$ bifida, segmentis acuminulatis. Per. alte emersa pyriformia altiuscule 5-carinata, carinis subtuberculosis.

B. *Flores dioici.*

[*Eu-L. pulvinata* L. et Ldng. Pusilla albida. F. erecto-patentia concava oblongo-rotunda, lobulo 4-plo breviore. Foliola paulo minora suborbiculata ad $\frac{1}{3}$ bifida, segmentis obtusis. Bracteola ovalis ultra $\frac{1}{2}$ bifida. Per. turgide obovata brevirostria humiliter 5-gona.—*Brasilia, Peruvia.*]

10. *Eu-L. cladobola.* Pusilla pulvinata pinnata, ramis parvifoliis deciduis. F. subplana ovato-lanceolata obtusata, lobulo 5-plo breviore, c. mediocribus. Foliola paulo breviora ovali-rotunda ad $\frac{1}{2}$ bifida, segmentis subcuspidatis.

Obs. Lejeuncas alias paucas dioicas legi, facie *Eu-Lejeuneæ* prædita, ob perianthii defectu autem haud certe ad hoc subgenus revocandas.

§ 2. Microstipæ.

11. *Eu- L. humefacta.* Elongata pinnata, ramis pro m. paucis brevibus, sæpe floriferis (♂ vel ♀). F. late semiovata rotundata, lobulo fere

4-plo minore. Foliola fere 4-plo minora subrotunda, segmentis subobtusis. Br. foliis breviores, vix ad $\frac{1}{3}$ bifidæ, paulo inæquilobæ; bracteola ligulata ad $\frac{1}{4}$ bifida. Per. emersa late pyriformia rotundato-truncata subcompressa.

12. *Eu-L. filipes.* Elongata laxe pinnata. F. parva ovali-rotunda, lobulo 3-plo breviore interdum obsoleto. Foliola 5–6-plo breviora rotundo-quadrata, segmentis triangularibus acutis. Br. foliis æquales, ad $\frac{2}{3}$ bifidæ, lobulo paulo angustiore; bracteola lanceolato-ligulata ad $\frac{1}{5}$ bifida. Per. altinscule emersa pyriformia subretusa subcompressa alte carinata.
13. *Eu-L. Carolensis.* Tenuissima subramosa. F. late oblonga obovatave, lobulo 3–4-plo breviore. Foliola 4-plo minora subsquarrosa cuneata, segmentis patulis subulatis basi 3 c. latis. Br. foliis subæquales, lobulo parvo; bracteola ligulato-oblonga vix ad $\frac{1}{2}$ bifida. Per. emersa anguste pyriformia rotundata longirostria sat compressa.
14. *Eu-L. Coffeæ.* Laxe subpinnata. F. subfalcato-oblonga, lobulo obsoleto. Foliola 6–7-plo minora bipartita, segmentis suberectis basi 2 c. latis. Br. foliis breviores profunde bifidæ inæquilobæ; bracteola longe lanceolata fere ad $\frac{1}{2}$ bifida. Per. pyriformia subcompressa obtuse carinata.
15. *Eu-L. prorepens.* Pinnatim ramosa. F. late ovato-oblonga, lobulo 0. Foliola 4-plo breviora cuneata profunde bifida, segmentis basi 3–4 c. latis. Br. foliis sublongiores, lobulo minuto nullove; bracteola cuneata breviter bifida. Per. subemersa cuneato-obpyramidata compressula.
16. *Eu-L. Obidensis.* Vage ramosa. F. late ovata rotundata obtusave, elobulata. Foliola 3-plo breviora subrotunda ultra $\frac{1}{2}$ bifida. Br. foliis subminores elobulatæ; bracteola cuneato-lanceolata vix ad $\frac{1}{2}$ bifida. Per. subemersa pyriformia subcompressa, carinis apice truncato-prominulis.

§ 3. PLANILOBÆ.

A. *Foliola sæpe angustiuscula, profunde bifida.*

17. *Eu-L. inundata.* Tenuis sæpe valde elongata, ramulis ♂ et ♀ crebre pinnulata. F. angusta ligulato-ovalia rotundata, lobulo 2–7-plo breviore cuneato trapezoideove subulato-apiculato. Foliola 3-plo breviora angusta, caule vix latiora, segmentis suberectis subulatis. Br. parvæ breviter æquilobæ; bracteola ligulata breviter bifida. Per. parvula obovata ab ipsa basi argute 5-carinata, carinis subpapulosis.
18. *Eu-L. suffruticola.* Tenerrima laxe pinnatim ramosa, ramis ♀ interdum dichotomis. F. late ovato-oblonga rotundata, lobulo 4–5-plo breviore subquadrato apice ligulato, c. parvulis. Foliola vix duplo breviora ovali-rotunda, segmentis falcato-conniventibus. Br. parvæ paulo inæquilobæ; bracteola obovato-lanceolata ad $\frac{1}{2}$ bifida. Per. emersa obovata compressula 5-carinata.
19. *Eu-L. solanicola.* Pusilla florentissima, pinnatim ramosa, ramis brevibus. F. oblonga rotundata, lobulo 3–4-plo breviore rhomboideo apice subulato. Foliola 2-plo breviora ovata, laciniis late subulatis incurvis basi 4c. latis. Br. foliis subminores paulo inæquilobæ; bracteola oblongo-cuneata ad $\frac{1}{3}$ bifida. Per. subemersa valde diaphana subturbinata turgidiuscula acute 5-carinata.
20. *Eu-L. Artocarpi.* Pusilla, priori similis, diversa foliis late ovatis,

lobulo ovato-quadrato subacuto; foliolis superioribus increscentibus, laciniis lanceolatis basi 6c. latis; bracteis foliis æquimagnis, bracteola lanceolato-oblonga; per. alte emerso, obconico-pyriformi, compressulo.

B. *Foliola rotundiora solum ad ½ bifida.*

21. *Eu-L. setiloba.* Pusilla tenella subramosa. F. oblonga obtusata, lobulo minuto ad dentem subulatum 4c. longum fere redacto. Foliola fere 4-plo minora oblonga, segmentis acutis. Br. foliis æquilongæ, lobis fere æquilongis, inferiore duplo angustiore; bracteola lanceolato-oblonga ad ½ bifida. Per. subemersa globoso-pyriformia alte 5-carinata.
22. *Eu-L. muscicola.* Pusilla vage ramosa. F. late ovata subrotundata, plica basali minuta dentem 1–2c. altum proferente. Foliola 6-plo breviora rotunda. Br. foliis breviores parvilobulatæ; bracteola ovali-lanceolata brevissime bifida. Per. emersa pyriformi-oblonga 5-carinata, carinis subpapulosis.
23. *Eu-L. subsessilis.* Flaccida tenerrima subpinnata. F. majuscula late ovata abrupte subacuta obtusave obscure crenulata, lobulo subnullo. Foliola 4–5-plo minora. Fl. ♀ in caule fere sessiles, innovatione simplice suffulti. Br. foliis 2-plo minores, lobulo subnullo; bracteola ligulata apice bidentata. Per. emersa brevi-clavata longirostria 5-carinata, carinis apice truncatis.
24. *Eu-L. Tarapotensis.* Tenaciuscula. F. majuscula ovato-oblonga subfalcata, lobulo subnullo. Foliola foliis 4–5-plo minora. Fl. in ramulo brevissimo terminales, innovatione simplice. Br. parvæ, altera parvilobulata, altera elobulata; bracteola cuneato-oblonga bifida basi utrinque connata. Per. alte emersa, obconico-pyriformia subcompressa brevirostria, carinis apice rotundo-prominulis papulosis. Br. ♂ monandræ.

§ 4. Cardianthæ. *Per. sat compressa, carinis 2 posticis humilibus, carinula antica sæpe subnulla, apice obcordata.* Pl. pusillæ mediocresve, omnes monoicæ. F. lobulo parvo nullove. Foliola parva, in unica sp. majuscula.

A. *Foliola rotunda ad ½ bifida.*

25. *Eu-L. cordiflora.* Majuscula. F. late ovato-oblonga rotundata recte complicata, lobulo 4-plo breviore. Foliola vix duplo minora, segmentis subobtusis. Per. obcordato-pyramidata sat compressa postice humiliter bicarinata, margine interdum obsolete alata. Andr. cauligena, br. 5-jugis.
26. *Eu-L. Cauapunensis.* Tenella decomposita. F. falcato-oblonga rotundata subsinuato-complicata, lobulo sub 4-plo breviore. Foliola 4-plo breviora rhombeo-rotunda, segmentis acutis. Bracteola angusta cuneato-lanceolata ad ½ bifida utrinque 1-dentata. Per. magna obcordato-cuneata valde compressa tenuirostria. Andr. terminalia, br. 3-jugis.
27. *Eu-L.? siccata.* Pusilla vage ramosa. F. semiovata rotundata obtusave subpapulosa crenulata, lobulo 5-plo breviore. Foliola 4–6-plo breviora, segmentis subobtusis. Br. perparvæ crenulatæ; bracteola ovalis breviter bifida. Per. alte emersa obovata compressa, apice subtruncata raro subobcordata, carinis papulosis.

B. *Foliola angustiora ultra ½ bifida.*

28. *Eu-L. drymophila.* F. ovato-oblonga rotundata raro subacuta, lobulo

4-plo breviore nullove. Foliola 3-plo breviora squarrosula ovali-cuneata, segmentis subulatis basi 3–4c. latis. Per. emersa obcordato-cuneata compressa, interdum rudimentarie alata, carinis posticis obtusis demum in unam latam subconfluentibus.

29. *Eu-L. orbicularis.* Caules in stratum tenuem orbicularem effusi. F. ovato-oblonga rotundata obtusatave, lobulo obsoleto. Foliola 4-plo breviora ovata, segmentis basi 3c. latis. Per. alte emersa pyriformia compressula subretusa (parum obcordata) carinis posticis valde obtusis.

30. *Eu-L. limbata.* Caules sparsi subpinnati. F. oblonga rotundata marginata, lobulo 5-plo breviore nullove, cellulis sat magnis ($\frac{1}{25}$mm), submarginalibus plus duplo minoribus. Foliola 3-plo minora ovali-subcuneata, laciniis basi 2–3c. latis. Br. foliis minores. Per. alte emersa triangulari-pyriformia rotundato-retusa sat compressa.

1. EU-LEJEUNEA MEGALOSTIPA, Spruce.

Hab. In M. *Guayrapata* Andium Quitensium, alt. 3000m, cum *Lejeunea laxifolia* Tayl. in arborum ramulis repens.

F ·75 × ·6, 1·05 × ·9, *lob* ·4, *c* $\frac{1}{60}$–$\frac{1}{50}$; *f*^{ta} ·6 × ·6; *br* ·8–·9; *per* 1·1 × ·6mm.

Pallida pellucida prostrata. Caules ½–1-pollicares tenelli pinnati, interdum ramis microphyllis pinnulati.

Folia subimbricata late oblique semicordato-ovata, basi antica caulem late transeuntia, apice rotundata raro triangulari-obtusa, facie subpapulosa, margine obscure crenulata, subsinuato-complicata; lobulus majusculus dimidium folium subexcedens ovatus inflatus, apice libero plerumque involuto; cellulæ fere minutulæ æquilateræ, 6-(dein 5–8-) gonæ, solum folii marginem versus subquadratæ, limitibus pellucidis haud incrassatis, centro pellucidæ, ambitu latiuscule opacæ, papuloso-prominulæ.

Foliola magna, foliis sæpe æquilata paulo breviora, orbiculata vel ovato-orbiculata, ad medium fere usque bifida, segmentis patulis sinuque acutis obtusisve, basi subcordata, margine incurva.

Flores monoici: ♀ terminales, fere semper dichotomiales, innovationibus (vel altera saltem) iterum floriferis. Bracteæ foliis subæquilongæ complicato-bilobæ, lobis obtusis, antico ovato-rhomboideo, postico multo angustiore ligulato; bracteola bracteis basi subconnata spathulato-obovata ad ⅓ anguste bifida.

Perianthia foliis sublongiora obovato-pyriformia compressula plicato-5-carinata rotundato-truncata tenuirostria, carinis vix subpapulosis.

Andrœcia ramulo tenui constantia vel ramum terminantia; bracteæ plurijugæ.

A cæteris omnibus *Eu-Lejeuneis* foliolis magnis aliena, *Euosmo-Lejeuneis* affinior; ab his tamen diversa aspectu, textura, odoris absentia, foliis grandilobis, etc.

Obs. In some stem-leaves of the ordinary size, the lobule is larger and more inflated, and contains two narrow-oval bodies—not antheridia, but pupæ, either of some minute coleopterous insect or of one of the apidæ. Those I saw were battered, but I could make out they had rudimentary legs.

2. Eu-Lejeunea cyathophora, Mitt.

In Lond. Journ. Bot. (1851).

Hab. *Pichincha* et *Tunguragua*, alt. 2500–3000^{m}, utrinde supra *Lejeuneam laxifoliam* Tayl. repens.

F ·6 × ·4; *lob* ·3; *c* $\frac{1}{35}$–$\frac{1}{32}$; *f*^{la} ·35 × ·35; *br* ·65; *br*^{la} ·55 × ·3; *per* ·85 × ·4, *rostellum* ·15^{mm}.

Pusilla viridis. Caules $\frac{1}{4}$-pollicares parce vage ramosi.

Folia paulo imbricata subplana horizontalia oblique ovata rotundata, raro obtusa subacutave, repandula, integerrima, medio infero subsinuato-complicata; lobulus = $\frac{1}{2}$ folium anguste ovato-fusiformis valde involutus, apice occulto; cellulæ mediocres pellucidæ leptodermes, chlorophyllo parco annulari.

Foliola subcontigua foliis vix duplo minora, subrotunda, ad $\frac{1}{3}$ bifida, sinu segmentisque obtusis, raro acutis, plana.

Flores monoici: ♀ terminales, innovatione (sæpe prolifera) suffulti. Bracteæ foliis parum longiores oblique ovatæ obtusæ profunde complicato-bifidæ, lobulo parvo obliquo ligulato rotundato; bracteola obovato-oblonga ad $\frac{1}{2}$ bifida, sinu segmentisque acutis.

Perianthia emersa pellucida obovata inflata, ecarinata, ex apice depresso rostellum turbinatum apice minute perforatum proferens. Capsula subglobosa.

Androecia ramulis folio caulino sublongioribus constantia; bracteæ 3–4-jugæ.

Obs. The cells of the rostellum are ranged vertically, and are transversely oblong, becoming wider where the globose head of the turbinate rostellum is widest, so that the lines formed by their lateral juncture resemble meridians of longitude. The whole apparatus is a miniature copy of the horn, or "lantern" of *Fulgora lanternaria*, and becomes cyathiform only when ruptured by the emission of the capsule.

3. Eu-Lejeunea leucophæa, Spruce.

Hab. In ramulis ad *Rio Verde*, *fl. Pastasa* affluentem, alt. 1500^{m}.

F ·75 × ·5, *lob* ·15–·2; *c* $\frac{1}{40}$; *f*^{la} ·55 × ·5; *br* ·6; *br*^{la} ·6 × ·35; (*fl. axill. br* 1·0; *br*^{la} 1·0 × ·55); *per* ·9 × ·35^{mm}.

Albescens, pellucida, tenerrima, prostrata pendulaque. Caules 2-pollicares flaccidi pinnatim ramosi, ramis pro more brevibus dissitis.

Folia subimbricata subplana, basi saccata angulo 45°, a lobuli apicem fere recto, divergentia, oblique semicordato-oblonga—vel-ovato-ovalia, rotundata v. obtusata; lobulus inflatus, folio 4-plo brevior, margine (ex involutione) transverso, apice occulto; cellulæ parvulæ, æqualiter subincrassatæ, marginem versus multo minores, prope basin majores.

Foliola magna, foliis æquilata, vix $\frac{1}{3}$ breviora, profundiuscule cordato-ovato-orbiculata, vix ad $\frac{1}{2}$ obtuse bifida, segmentis acutis obtusisve.

Flores monoici: ♀ in ramis terminales, innovatione simplice suffulti, raro dichotomiales. Bracteæ foliis subminores—floris axillaris tamen majores—profunde bilobæ, complicatæ; lobis lanceolato-oblongis rotundatis, lobulis multo minoribus subligulatis obtusis v. altero acuto; bracteola obovato-lanceolata haud ad $\frac{1}{3}$ usque bifida, segmentis subacuminatis.

Perianthia alte emersa, clavato-pyriformia, rostello brevi latiusculo ore subampliato coronata, compressula, superne alte 5-carinata, demum ab apice 4-valvia, valvulis apiculatis, apiculo sublineari cellulas 5 longo, c. 2 (apice ipso c. 3) lato. Calyptra paulo brevior pyriformis basi attenuata.

Amenta ♂ *minuta* albida crebra lateralia, f. caulino subduplo breviora, incurvula, late ovoidea, compressa; bracteæ 3–5-jugæ confertæ.

Foliis foliolisque magnis, his pro ratione etiam majoribus basique valde distincte cordatis; amentis ♂ semper minutis; perianthiis altius carinatis, rostello latiore, a *L. flava* certe distincta species videtur.

4. EU-LEJEUNEA FLAVA (Sw.)

Jungermania flava Sw. Prodr. Fl. Ind. Occ., 144. *Lejeunea flava* G. L. et N. Syn. Hep, 373.—*L. thymifolia* Nees, Syn. Hep. 372 (pro parte).

Hab. In arborum cortice radicibusque, necnon in foliis vivis, rarius in herbis (*Aroideis*, *Musaceis*, etc.) et filicibus, interdum ad rupes, per sylvam Amazonicam vulgata, in Andium radicibus vix supra 1300^{m} ascendit. Per Americam tropicam late dispersa, montes tamen altiores effugiens. In India orientali tam continentali quam insulari; etiam in Europa occidentali (Hibernia, prope *Killarney*) inventa est.

F ·6 × ·38, ·5 × ·3, ·45 × ·35; *lob* ·1–·08; *c. mediæ* $\frac{1}{40}$–$\frac{1}{5}$; *f*^{la} ·35 × ·3, ·3 × ·25, ·2 × ·2; *br* ·8–·5; *br*^{la} ·6 × ·2; *per* 1·2 × ·4, ·75 × ·3, ·65 × ·4^{mm}.

Viridis vel albo-viridis, siccando flavida, vel (in var.) albida, siccando immutata vel flavida, tenella, tegeticulam latam densam sistens vel sparsa. Caules $\frac{1}{4}$–2-pollicares vage ramosi vel pinnati, ramis fertilibus monotropo-innovandis vel dichotomis interdum ascendentibus.

Folia contigua vel subimbricata, ad plicam erecto-patentia dein subdivergentia oblique oblonga vel ovato-oblonga rotundata concavula basi subdecurrente complicata; lobulus parvus folio 5–7-plo brevior triangulari-saccatus, margine inflexo transverso vel subascendente, apice brevi acuto plerumque occulto, raro obsoletus; cellulæ parvulæ subplanæ pellucidæ, pariete ad angulos subincrassato (vel non), æquilateræ, inferiores subelongatæ.

Foliola inferiora minora distantia, superiora majora contigua foliis vix duplo breviora ovali-orbiculata orbiculatave—interdum subovata—ad $\frac{1}{3}$, raro ad $\frac{1}{2}$ usque, ab apice bifida, segmentis subobtusis acutisve, vel altero acuto altero breviore obtuso, rima pro more angusta, basi rotundata—raro indistincte cordata.

Flores monoici: ♀ in caule ramove subrecte innovando-prolifero—raro dichotomo—terminales. Bracteæ foliis subæquilongæ vel majores, complicatæ, ultra $\frac{3}{4}$ bilobæ, lobis obtusis, antico lanceolato ovalive, postico breviore duplo angustiore ligulato; bracteola angusta cuneato-lanceolata, carinata, ad $\frac{1}{3}$—raro ad $\frac{1}{2}$—bifida, segmentis acutis.

Perianthia *viridia*, paulo emersa, pyriformia vel pyriformi-oblonga, ex apice rotundato vel solum obtuso brevirostria, compressula, antice depressa medio carinulata, postice subobtuse bicarinata, lævia—alia fere æqualiter pentagona; post capsulam emissam sæpe basi elongata,

quasi-stipitata. Calyptra tenuis obovata. Capsula ovato-globosa in pedicello longiusculo exserta.

Andrœcia vel ramulo foliis caulinis breviore, bracteis 3-v. 4-jugis constantia; vel in ipso caule ramove terminalia longispica, bracteis 6–10-jugis laxiusculis turgidis pro more parvulis.

Speciei tam late distributæ formas innumeras legi, limites tamen inter illas frustra quæsivi, plurimis vix pro varietatibus (meo sensu) habendis. Solum in duas cohortes, sive subspecies, primo visu omnes se dividunt, sc.

1. *flava* (typica) ad arborum radices, in truncis vetustis et in rupibus habitans, colore in vivo amœne-vel flavo-viridi, in sicco fere semper flavescente; foliis oblique oblongis, nunquam semicordatis; foliolis raro ultra $\frac{1}{3}$ alt. bifidis, basi rotundatis; bracteola angusta sæpe triplo longiore quam lata.
2. *albida*, in foliis vivis vel supra alias hepaticas reptans, colore tam recente quam post siccationem albicante; foliis vel oblongis vel subovatis—basi latioribus interdum semicordatis; foliolis sæpe ad dimidium usque bifidis basi minus raro subcordatis; bracteola latiore—vix duplo longiore quam lata.

Formæ intermediæ inveniuntur, quæ nexum completum inter has duas cohortes præbent.—Ad subsp. *euflavam* pertinet forma *longicaulis*, caulibus elongatis subramosis, ramisque parallelis stratificatis plagas latas in scopulorum facie ad fl. *Negro* cataractas, necnon ad arborum vicinarum pedem, efficiens. Folia dissitiora subfalcata. Andrœcia sæpius terminalia longispica. Cæspites unisexuales adveniunt, alii tamen plantas monoicas cum unisexualibus mixtas monstrant.—Forma *dichotoma*, floribus ♀ fere constanter ex innovationum oppositarum furca ortis, crescit in M. *Guayrapurina* (alt. 900^{m}) et ad *S. Carlos* fluvii *Negro*, in corticibus. Huic formæ adsunt foliola interdum submajora, $\frac{1}{2}$ folium subsuperantia. —Formæ pusillæ variis locis vigent; earum una, ad *Caripi* prope *Pará* lecta, intermedia est quoad caracteres inter *euflavam* et *albidam*.—Hæ omnes formæ foliolis gaudent ab apice pro more ad $\frac{1}{3}$ altitudinis solum bifidis; in eodem cæspite tamen sæpe adveniunt plantæ quarum foliola ad $\frac{1}{2}$ usque fissa sunt.—Planta Hibernica typica est, cum Swartziana originali bene conveniens, quoad colorem flavovirentem, foliola magna ad $\frac{1}{2}$ fissa, etc.

Subsp. *albida* quoque polymorpha est, formasque plures, inter se parum diversas, induit. Ad fl. Negro, in *Musæ* folio carioso legi formam *platystipam*, foliolis paulo latioribus quam longis (·3 × ·35^{mm}), bracteis foliis caulinis brevioribus. Forma *subacutifolia*, foliis plerisque (ac in typo) rotundatis obtusatisve, superioribus tamen interdum abrupte subacutis, cæterum nullo modo a typo diversa, crescit in fl. *Negro* sylvis super gramina (Parianæ sp.) Forma *parvi-angustifolia*, recens albescens, siccando flavida, foliolis cordato-orbiculatis, nec aliter a typo diversa, habitat in trunco vetusto ad *Caripi* prope *Pará*.

Obs. As several very distinct species are found in herbaria under the name "*Lejeunea flava*"—even Lindenberg having sometimes given a form of the very distinct *L. denticulata* for it—I add a few diagnostic marks which may aid in identifying it. Although it runs into many forms, none of them are widely apart, and scarcely merit being called varieties. The two "subspecies" I have described above are better distinguished by their colour and place of growth than by any structural character; the

yellowish-green form growing chiefly about the roots of trees and shrubs, on old trunks, and on shaded rocks, not often mixed with other species; the whitish form almost invariably on living leaves of trees, and even of herbs, where it is often accompanied by other foliicolous *Lejeuneæ*.

In typical specimens, especially of the subspecies *albida*, the leaves on the main stem—or, at least, on its lower half—have the lobule decurrent at the fold (which is usually straight—not convex) at an angle of about 45°; and incurrent (or obliquely ascending at the incurved free upper margin, at about the same angle; whence the upper margin of each lobule is in a line with the lower margin (the fold) of the next lobule on the opposite side of the stem, so that the outlines of the lobules form, as it were, a series of W's, written consecutively across the stem.

In the upper leaves of the stem, and in nearly all the branch-leaves, the lobules are more turgid (rounded at the fold), and their upper margin more incurved—more nearly transverse; so that their outlines are not quite continuous with those of the leaves on the opposite side of the stem.

In all forms of the species the leaves are obliquely *oblong*, narrowed at the insertion, then suddenly dilatated at the antical base, but not wider there than at the middle, so that they are rarely to be called somewhat *ovate*, and still more rarely semicordate.

Medial leaf-cells smallish ($\frac{1}{45}$—$\frac{1}{40}$ mm in diameter) nearly equal and equilateral, those towards the apex being very slightly smaller and towards the base slightly elongate; all pellucid, containing little chlorophyll, and with the walls very slightly (or not at all) thickened at the angles.

Underleaves usually cloven to the middle (especially in the subspecies *albida*), but often to only $\frac{1}{3}$ of their length; the deepest sinuses being acute, the shallowest obtuse: both states occasionally found on the same plant. The segments, mostly subobtuse, are often decidedly acute, and it is common to find the two segments of unequal length—the shorter being obtuse, the longer acute. The largest and best formed underleaves are just half the length of the adjacent leaves—rarely a little longer and never much shorter. Their normal form is orbicular—sometimes slightly lengthened (oval), at others slightly widened (oblate), more rarely subovate.

Inflorescence monoicous, the ♀ flowers being terminal on the branches, or even on the stem, and subtended by a simple or repeatedly proliferous innovation—or sometimes by a pair of opposite ones. Unisexual plants are not infrequent, but rarely occur apart from normal monoicous ones. Bracts about as long as stem-leaves, in fertile flowers—but sometimes much longer in sterile flowers—complicato-bilobed, with obtuse lobes, the antical lobe lanceolate, the postical only half as wide and usually shorter. Bracteole usually narrow lanceolate—varying to cuneato-lanceolate and obovate, and wider in the white than in the yellow varieties; in fertile flowers it is cloven to about the middle, but in sterile flowers more deeply.

Perianth very slightly emersed, *green*, pyriform, rounded at the apex, and with a rostellum of moderate length, slightly compressed, obtusely bicarinate at the back, and very slightly keeled along the middle of the depressed upper face, all the keels perfectly smooth. After the emission of the capsule, the perianth often becomes enlarged, subclavate, and, as it were, stipitate, by the lengthening of its base. Capsule ovato-globose, on a longish geniculato-articulate pedicel of 12 tiers of cells.

Androecia are either a short ramulus, bearing only 3 or 4 pairs of bracts

—rarely more; or are terminal on the branches—or even on the stem—and are then often elongate, having 10 or more pairs of smallish laxly-imbricated diandrous bracts.

The chief variations of *L. flava* are already indicated above. The Irish form (=*L. Moorei* Lindberg. Hep. in Hibernia lect. 1875)—first found near Killarney by Mackay,* and recently by Lindberg and Moore—is quite the same as the West Indian, as represented by Swartz's own specimens in herb. Hook. It belongs to the yellow-green form, although one of Moore's specimens has whitish plants intermixed; and it has the large underleaves cloven to about the middle, with usually obtuse segments,—or with one segment longer and acute, the other shorter and obtuse, as is frequent also in S. American specimens. And it is to be noted that some states of *L. serpyllifolia* have quite as obtuse underleaves as *L. flava*. The large form of *serpyllifolia*, growing in North Yorkshire (Mowthorpe Dale, etc.), has them often very obtuse, but subacute ones are also present. The var. *cavifolia*, as represented by Stabler's Westmoreland, and some of my own Pyrenæan specimens, has also often very obtuse underleaves.

A few easily-observed characters usually suffice to distinguish every form of *L. serpyllifolia* Dicks. from *L. flava* Sw. (1) The size is smaller and the colour more rarely yellowish; (2) the leaves rounder, and with a much longer and more turgid lobule, sometimes equalling half the leaf; (3) the cells larger ($\frac{1}{30}$ mm in diameter, against $\frac{1}{45}$–$\frac{1}{40}$ mm in *L. flava*); (4) the underleaves variable in size, generally smaller than in *L. flava*, always cloven quite to the middle, and with the segments oftener acute, (although in some forms obtuse); (5) the perianths rather shorter, acutely 5-carinate, (whereas in every form of *L. flava* the keels are very slightly raised, and obtuse).

As to *L. thymifolia* Nees (Syn. Hep. 372), Gottsche admits it to be a composite species, as it stands in 'Syn. Hepaticarum.' Only the Javan and Indian specimens (he says) should be called by that name. The plant from Serra de Estrella (Brazil), gathered by Beyrich, is a form of *L. pulvinata*; and that from Madeira (perhaps also the Mexican plant) belongs to *L. flava*. (Mex. Leverm. 218.)—Whether there be, even in India, any "*L. thymifolia*" distinct from *L. flava* is doubtful, for I have examined Javan specimens of the former, named by Nees himself, and could find no character to separate them.—The plant published as *L. thymifolia* N. by Mitten in Hooker's 'Handbook of the N. Zealand Flora' not only does not agree with the original description, but the specimens show it to be distinct also from *L. flava* and *serpyllifolia*. I have given its spec. char. above, and add here a few diagnostic marks: *Eu-Lejeunea Sinclairii* S. (="*L. thymifolia* N." Mitt. l. c.) a *L. flava* et *serpyllifolia* foliis fornicatis prælate ovatis—fere triangularibus—sæpius subacutis; lobulo magno $\frac{1}{3}$ folium excedente; bracteola utrinque cum bracteis connata; perianthii carinis prælatis compressisque, bene distincta est.

5. Eu-Lejeunea hebetata, Spruce.

Hab. In sylva *Canelos*, juxta fl. *Pastasa*, supra *Odonto-L. rhomaleam* parasitans.

* The Eng. Bot. figure of "Jung. serpyllifolia," t. 2537, April 1, 1813, made from specimens gathered at Killarney by Sir T. Gage, is so much more like *L. flava* than *L. serpyllifolia* that I suppose it may really be that species.

F ·8×·6; *lob* ·15; *c* $\frac{1}{30}$; f^{la} ·35×·35, ·3×·35; *br* ·7×·5; br^{la} ·5×·4; *per* 1·0×·45mm.

Tenella pallide viridis leniter fuscescens. Caules semipollicares laxe subpinnati, aliis ramis brevibus subparvifoliis.

Folia subimbricata majuscula late patentia concava oblique semicordato-ovata, fere dimidiata, rotundata obtusatave, subpapulosa angulato-repanda, basi recte complicata; lobulus plus 5-plo brevior subrhombeus acutus incurvo-inflatus; cellulæ mediocres subconformes pellucidæ, pariete valido ad angulos vix incrassato.

Foliola plus duplo minora patentia late ovata carinata, ultra medium bifida, segmentis anguste ovatis obtusatis, margine recurvulo repando-crenulato.

Flores dioici (?): ♀ in caule ramove terminales, innovatione hinc v. sæpius utrinque suffulti. Bracteæ foliis subminores profunde (ad $\frac{4}{5}$) bifidæ, lobo falcato-ovali obtuso angulato, lobulo parvo, altero rhombeo altero ligulato; bracteola ovali-rotunda ultra $\frac{1}{2}$ bifida, segmentis contiguis subacutis.

Perianthia emersa pyriformi-oblonga—demum stipitato-elongata fere clavata—brevirostria, subcompressa, argute 5-carinata, carina antica humiliore, lævia.

A *L. serpyllifolia* Dicks. differt foliis valde obliquis distincte semicordatis, lobulo minuto; *foliolorum segmentis obtusissimis*, et perianthio longiore.

6. EU-LEJEUNEA LEPTALEA, Spruce.

Hab. Andes Quitenses: in arborum truncis, socio *Hypno scarioso* Tayl., ad montis *Altár* latera, alt. 3350m., loco *Hacienda de Titaicún*.

F ·5×·45, ·45×·38; *lob* ·15 (·2 ad plicam mensus); *c* $\frac{1}{30}$; f^{la} ·2×·2, ·15×·15; *br* (*lob*) ·4×·2; *per* ·75×·4mm.

Laxe cæspitoso-prostrata, pallide viridis, tenerrima, foliis valde deciduis. Caules $\frac{1}{2}$–1-pollicares tenues pinnati, ramis brevibus inæquilongis, v. subbipinnati, ramulis sæpe parvifoliis (lobulo dimidium folium æquante).

Folia parum imbricata, subpatula, a basi lata decurrente oblique ovato-oblonga obtusata; lobulus folio 3-plo fere brevior ovatus subinflatus, ad plicam convexus, apice exciso-acutus v. in apiculum brevi-subulatum porrectus; cellulæ parvæ pellucidæ leptodermes subplanæ, inferiores (a folii basi ad medium fere usque) subduplo majores sæpeque vacuæ, ocellum magnum rotundum sistentes.

Foliola foliis 2–3-plo minora, dissita, subrotunda, ad $\frac{1}{2}$ bifida, sinu obtuso, segmentis acutis subobtusisve.

Flores monoici (?): ♀ in ramulo brevi terminales, innovatione simplice microphylla suffulti. Bracteæ foliis paulo minores appressæ complicato-bilobæ, lobis oblongo-ligulatis, postico duplo breviore, triplo angustiore; bracteola ovalis breviuscule bifida, rima angusta.

Perianthia bracteis fere duplo longiora pyriformia subrostellata subæqualiter 5-carinata, carinis humilibus acutis, demum apice 2–5-fida.

Androecia . . . .

Habitu L. flavæ, distincta tenuitate; foliis caducis magis decurrentibus, cellulis superioribus minoribus, inferioribus multo majoribus, lobulo majore planiore sæpius apiculato; bractearum lobis ligulatis; etc.—De inflorescentia minus certus sum, quum androecia invenire non potui.

7. EU-LEJEUNEA COCHLEATA, Spruce.

Hab. In M. *Tunguragua*, ad arbores supra lichenes repens; in M. *Chimborazo* supra folia viva.

F ·4 × ·3, ·4 × ·35; *lob* ·15; *c* $\frac{1}{35}$–$\frac{1}{50}$; *fl*^{a} ·15 × ·15; *br* ·4; *br*^{da} ·35 × ·2 ·35 × ·15; *per* ·7 × ·4^{mm}.

Prostrata, ex olivaceo virescens. Caules pollicares, laxe pinnatim ramosi.

Folia vel dissita vel subcontigua, raro subimbricata, patentia, late oblique semicordato-ovata obtusa vel sæpius rotundata, cochleato-concava, margine postico tamen supra lobulum apiceque ad conchæ orificii instar recurvula, basi sinuato-complicata; lobulus vix 3-plo brevior inflatus subrotundus sed tam convolutus ut late ovoideus videatur, apice acuto incurvo; cellulæ parvæ subconformes, subplanæ, leptodermes ad angulos vix subincrassatæ, pellucidæ, ambitu tenuiter opacæ.

Foliola foliis triplo fere minora patula suborbiculata concava, fere ad medium usque acute bifida, segmentis obtusis raro acutis.

Flores monoici et dioici: ♀ terminales; ramus fertilis v. brevissimus, foliis 0–3-jugis infra florem stipatus, v. raro elongatus polyphyllus; in plurimis exemplis innovatione simplice, in paucis prolifera, auctus. Bracteæ foliis subæquales, ultra medium bilobæ, lobo ovali obtuso, lobulo minore diagonali triangulari-linguæformi; bracteola oblonga v. obovato-lanceolata, vix ad $\frac{1}{4}$ acute bifida, segmentis acutis.

Perianthia pyriformi-obovata, brevissime rostellata, alte argute 5-carinata, pellucida, demum sæpe basi elongata. Calyptra pyriformis tenuis. Capsula ovali-globosa in pedicello longiusculo geniculato-articulato exserta.

Amenta ♂ prope caulis basin posita, ramulo tenuiusculo f. caulina subduplo superante constantia; bracteæ 3–6-jugæ mediocres.

L. patens Lindberg (Hep. in Hibernia lect.), paulo major est, pallida, sæpe albicans; foliis supra lobulum insigniter divergentibus, totis concavis, margine postico apiceque haud recurvis, cellulis subprominulis; perianthiis que magis obpyramidatis quam obovatis, mihi diversa videtur.

8. EU-LEJEUNEA FLAGELLARIS, Spruce.

Hab. M. *Chimborazo*, in arboris folio, plurimis aliis *Lejeuneis* consociata.

F ·65 × ·5; *lob* ·15; *c* $\frac{1}{35}$; *fl*^{a} ·33 × ·38; *br* ·5; *br*^{da} ·45 × ·3; *per* ·8 × ·4^{mm}.

Albicans, prostrata; caules pollicem longi, laxe bipinnati, ramique apice sæpe *flagelliformi-elongati*, sensim parvifolii, necnon (sed rarius) ramulis parvifoliis pinnulati.

Folia subimbricata patula, decurvo-concava, late semicordato-ovata abrupte acuta subapiculatave, inferiora caulina tamen haud raro obtusata, basin versus subsinuato-complicata, cum lobulo 4-plo breviore, apice brevi acuto, in sacculum parvum involuta; cellulæ subconformes mediocres vix incrassatæ planiusculæ, intus annulo endochromii angusto opaco cinctæ.

Foliola dissita foliis duplo breviora oblato-orbiculata, vix ad medium usque subobtuse bifida, segmentis acutis.

Flores dioici (?): ♀ in ramo brevi parvifolio terminales, innovatione tenui simplice (nec proliferâ) suffulti. Bracteæ foliis breviores, appressæ, lobis vix ad $\frac{1}{2}$ usque coalitis, complicatis, lanceolatis acutis, inferiore subminore; bracteola cuneato-lanceolata, fere ad medium bifida.

Perianthia alte emersa, luride rufa, pellucida, pyriformia vel oblongo-fusiformia, alte 5-carinata, obscure rostellata.

Obs. Adveniunt frequenter ramuli parvifolii, amenta male formata mentientes; anne igitur florescentia, in statu perfectiore, monoica?—Habitus fere *L. flavæ* robustioris.—Rami flagelliformes stricti rigidiusculi.—E foliis subacutis ad *Taxilejeuneas* accedit, differt ramo fertili semper unifloro.—*L. Choachina* G. et *L. hygrophila* G. (Hep. Novo-Granat., 62, 63), nostræ certe valde affines sunt, differunt tamen ramorum flagelliformium defectu; prior præterea folia habet apice reflexa, bracteas foliis longiores, bracteolam ovatam ad $\frac{1}{4}$ bifidam, flores monoicos, &c.; posterior foliola basi cordata, etc.

9. EU-LEJEUNEA RAMULOSA, Spruce.

Hab. Baños, ad pedem montis *Tunguragua*, in cortice, cum *Fabronia andina* Mitt. consociata; etiam ad arbores in sylvaticis montium *Chimborazo* et *Altar*: alt. 1800–3300^{m}.

F ·6 × ·4; *lob* ·1; *c* $\frac{1}{3-0}$; f^{la} ·4 × ·25, ·35 × ·2; *folia ramulina* ·25–·125; *br* ·65 × ·3; br^{la} ·5 × ·5; *per* 1·0 × ·6^{mm}.

Pusilla pallide viridis pellucida. Caules $\frac{1}{3}$–$\frac{1}{2}$-pollicares fragiles repentes, plus minus ramosi, sæpe ramulis elongatis microphyllis pinnati, vel etiam bipinnati, ramis assurgenti-cæspitosis.

Folia contigua vel subimbricata dimidiato-ovata sensim acutata subacuminatave, plana, basi recte complicata; lobulus 6-plo brevior semiovatus subinflatus—foliorum rameorum pro ratione major magisque inflatus; cellulæ pellucidissimæ subplanæ, mediocres, inferiores sensim majores. F. ramulina 3–5-plo minora ovato-lanceolata; suprema tota fere convoluta, *iis L. minutissimæ* sat similia.

Foliola subimbricata, dimidium folium excedentia, ovalia, ad $\frac{1}{2}$ obtuse bifida, segmentis suberectis acutis vel subacuminatis.

Flores monoici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis vix sublongiores erectæ, ad $\frac{1}{2}$ bilobæ, lobis acutis subintegerrimis, antico lanceolato, lobulo subbreviore ligulato-lanceolato (cum altero lobulo connivente); bracteola appressa subrotunda, ultra $\frac{1}{2}$ anguste bifida, segmentis acuminulatis.

Perianthia alte emersa pellucida pyriformia vel pyriformi-oblonga, obsolete rostellata, parum compressa, altiuscule 5-carinata, carinis cellula hic illic exstante subpapulosis.

Amenta ♂ vel ramulo tenui cauligeno toto, vel ramuli microphylli apice solo constantia; bracteis sub 5-jugis.

10. EU-LEJEUNEA CLADOBOLA, Spruce.

Hab. Ad pedem montis *Tunguragua*, juxta pagum *Baños*, alt. 1800^{m}, in saxis arborumque radicibus.

F ·55 × ·35; *lob* ·1–·12, *c* $\frac{1}{3-5}$; f^{la} ·4 × ·3, ·4 × ·25^{mm}.

Pusilla albido-viridis, procumbens, in pulvinulos alte stratificata. Caules subsemipollicares plus minus pinnati, ramis persæpe parvifoliis *deciduis*.

Folia contigua vel subdissita, acute patentia (angulo axiali 40°–60°) oblique ovato-lanceolata obtusata—subinde elongata sublinguæformia—subplana decurvulave, basin versus fere recte complicata et cum lobulo 5-plo breviore in sacculum triangularem connata; lobulus acutus

sæpe apice incurvus; cellulæ mediocres æquilateræ pellucidæ, chlorophyllo parco, subleptodermes, fere planissimæ.

Foliola subcontigua foliis vix dimidio breviora ovali-rotunda ad medium usque bifida, segmentis acutis cuspidatisve conniventibus, caulina radicellifera, ramulina sæpius calva.

Flores ?

L. pulvinata Lehm.! (ex ipso in hb. Hook.) nostræ subaffinis, folia habet confertiuscula concava oblongo-rotunda, cellulis parvis; foliola late imbricata, breviora sed latiora, segmentis obtusis.

11. EU-LEJEUNEA HUMEFACTA, Spruce.

Hab. Ad arborum truncos fluvii *Negro* aquis inundatos.

F ·45 × ·35, *lob* ·125, *c* $\frac{1}{10}$; *f*^{la} ·125 × ·1; *br* ·4; *br*^{la} ·35 × ·15; *per* ·55 × ·4^{mm}.

Pusilla pallide viridis prostrata effusa. Caules ½–1 poll. longi subparalleli pauciramei, ramis pro more brevibus sæpe masculis vel fœmineis.

Folia parum imbricata late semiovata rotundata, basi anticâ subsemicordata, posticâ recte complicata; lobulus semiovatus subinflatus folio 4-plo minor, apice incurvo conspicuove, raro obsoletus; cellulæ parvulæ subconformes, pariete subincrassato, pellucidæ.

Foliola distantia, foliis 4-plo fere minora, paulo ultra medium acute bifida, segmentis subobtusis.

Flores monoici: ♀ in ramo persæpe brevissimo terminales, innovatione brevi subparvifolia suffulti. Bracteæ foliis subbreviores erecto-patulæ breviter (vix ad ⅓) bifidæ, lobis rotundatis obtusisve subæquilongis, postico plus minus angustiore; bracteola ligulato-oblonga 2½-plo longior quam lata, ad ¼ bifida, sinu segmentisque acutis, nonnunquam utrinque unidentata.

Perianthia emersa late pyriformia, subretuso-truncata brevirostria compressa, antice carinulata, postice bicarinata, carinis sublævissimis.

Andrœcia lateralia cauligena, folio subæquilonga; bracteæ 2–3-jugæ majusculæ turgidæ.

L. radicans L. et G. (Gottsche, Mex. Leverm. 223), affinis, differt foliis angustioribus (·28–·42^{mm} longis, ·22–·28^{mm} latis) solum obtusis, foliolisque paulo minoribus (= folii $\frac{1}{6}$–$\frac{1}{5}$).

12. EU-LEJEUNEA FILIPES, Spruce.

Hab. Prope *Tarapoto* Andium Peruvianorum, supra *Porellæ* sp. repens.

F ·3 × ·25, ·25 × ·2, *f. ramea* ·15 × ·1, *lob* ·1, *c* $\frac{1}{4}$; *f*^{la} ·05; *br* ·3; *br*^{la} ·2 × ·1; *per* ·55 × ·35, ·45 × ·3^{mm}.

Pallide viridis pusilla. Caules tenues flexuosi elongati ½–1-pollicares, ex parte repentes dein assurgentes pendulive, distanter subpinnati, ramis pro more brevibus sæpe prolifero-divisis.

Folia subcontigua dissitave decurvula vel plana (superiora ramorum sæpe sensim minora) oblique ovali-rotunda, margine subundulata integerrima, apice rotundata obtusatave, subsinuato-complicata, lobulus decurrenti-subsaccatus ovatus, margine apiceque incurvus, folio 3-plo brevior, sæpe ad plicilam redactus v. etiam obsoletus; cellulæ pellucidæ parvulæ, apicales multo minores, inferiores sensim majores. Folia ramulina duplo minora pleraque elobulata.

Foliola distantia, caule haud latiora, foliis 5–6-plo breviora, rotundo-quadrata, ultra medium bifida, sinu lato, segmentis triangularibus vel late subulatis acutis.

Flores monoici: ♀ terminales, innovatione simplice proliferave suffulti; bracteæ foliis subæquilongæ, appressæ, oblique lanceolatæ ad $\frac{2}{3}$ bifidæ, lobulo lingulato-lanceolato, apicibus obtusis; bracteola lanceolato-ligulata ad $\frac{1}{5}$ solum bifida, segmentis acutis.

Perianthia altiuscule emersa pyriformia apice subretuso brevirostellata, subcompressa alte 5-carinata lævissima. Capsula parva globosa, demum in *pedicello elongato* siccando *filiformi* articulato exserta.

Amenta ♂ folio caulino subæquilonga, raro in ramo terminaliæ; bracteæ mediocres 3–5 jugæ.

L. Carolensis differt caule breviore, foliis tamen majoribus, foliolis duplo majoribus, bracteola fere ad medium bifida, et perianthio angustiore longirostri, carinis humilioribus.

13. EU-LEJEUNEA CAROLENSIS, Spruce.

Hab. San Carlos del Rio Negro et ad fl. *Uaupés*, in foliis vivis cum *Hookeria Patrisiæ*.

F ·4 × ·35, *lob* ·125, *e* $\frac{1}{32}$; *f*^{la} ·1 × 1; *br* ·4; *br*^{la} ·33 × ·13; *per* ·65 × ·35^{mm}.

Pusilla pallida effusa tenuissima. Caules $\frac{1}{8}$ poll. longi parce et subpinnatim ramosi.

Folia dissita vel subcontigua pellucida oblique late oblonga, vel subrotunda, vel subobovata rotundata, sinuato-complicata; lobulus 3-plo brevior subdecurrenti-saccatus turgide ovatus, apice incurvo in folium plerumque sensim abiens; cellulæ mediocres pellucidissimæ hexagonæ, marginales minores quadratæ.

Foliola 4-plo minora distantia, sæpe squarrosa, cuneata, ultra medium bifida, segmentis subdivergentibus subulatis acutis basi 3 cell. latis.

Flores monoici: ♀ terminales cum innovatione. Bracteæ foliis subæquilongæ oblique oblongo-lanceolatæ subacutæ vel obtusæ, lobulo sat minore linguæformi subobliquo; bracteola brevior valde pellucida ligulato-oblonga vix ad medium bifida, sinu segmentisque acutis.

Perianthia folia dimidio superantia anguste pyriformia rotundato-truncata retusulave longirostria, sat compressa, antice depressa carinulata, postice bicarinata.

Andrœcia brevia turgida, sæpius in ramis terminalia, raro lateralia; bracteæ 2-jugæ majusculæ.

Var. *minor*, foliis paulo angustioribus subfalcatis.—*S. Gabriel*, in cortice.

14. EU-LEJEUNEA COFFEÆ, Spruce.

Hab. San Carlos del Rio Negro, in *Coffeæ arabicæ* foliis vivis.

F ·5 × ·35; *c* $\frac{1}{35}$–$\frac{1}{30}$; *f*^{la} ·075, *br* ·35; *br*^{la} ·3 × ·1; *per* ·6 × ·3^{mm}.

Pusilla pallide viridis arcte repens; caules $\frac{1}{4}$–$\frac{1}{2}$ pollicares laxe subpinnatim ramosi.

Folia subcontigua a lata basi longitudinali oblique oblonga, nonnulla subfalcata, rotundata raro solum obtusa, obsolete lobulata; cellulæ mediocres oblongo-hexagonæ leptodermes, medio pellucidæ, in ambitu latiuscule subopacæ.

Foliola minuta, foliis 6–7-plo breviora, bipartita, segmentis suberectis subulatis basi 2 cell. latis.

Flores monoici: ♀ terminales, innovatione simplice suffulti. *Bracteæ foliis breviores* dimidiato-obovato-lanceolatæ obtusæ profunde bifidæ, lobulo altero breviore rhomboideo-lanceolato, altero (innovationi adnato) longiore subulato acuto; bracteola anguste lanceolata fere ad medium bifida, segmentis acutis.

Perianthia alte emersa, foliis caulinis paulo longiora, anguste obpyramidato-pyriformia, compressa obtuse 5-carinata, apice rotundato subretusove brevi-rostellata.

15. EU-LEJEUNEA PROREPENS, Spruce.

Hab. Ad fluvii *Huallaga* cataractas, supra filices.

F ·45 × ·35, *c* $\frac{1}{4\cdot5}$; *f*^{la} ·1–·15; *br* ·5; *per* ·6 × ·3^{mm}.

Minuta albido-viridis tenera tenuissima arcte repens. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicis longi pinnatim ramosi.

Folia contigua plana, e lata et sublongitudinali basi late ovato-oblonga rotundata, lobulo nullo; cellulæ subæquales parvulæ leptodermes.

Foliola parva, foliis 4-plo breviora, caule vix latiora, cuneata profunde bifida, segmentis lanceolatis subulatisve, basi 3 vel 4 cell. latis, subdivergentibus.

Flores monoici: ♀ in ramo brevi—raro in ipsius caulis apice—terminales, innovatione simplice suffulti. Bracteæ foliis sublongiores obovato-ligulatæ, altera elobulata, altera lobulo minuto lineari basi aucta; bracteola cuneata breviter bifida, segmentis acutis.

Perianthia parum emersa obpyramidato-cuneata brevirostria compressula 5-carinata, carinâ anticâ humiliore, carinis lateralibus apice lato rotundo-prominulis, fructu maturato turgescentia, demum (capsulâ egressâ) collapsa, ore bilabiata. Capsula majuscula ovata.

Andrœcia ramos terminantia—rarius ramulo proprio constantia; bracteæ sub 3-jugæ.

16. EU-LEJEUNEA OBIDENSIS, Spruce.

Hab. Ad fluminis Amazonum ripas prope *Obidos*, in cortice.

F ·65 × ·65, ·5 × ·4, *c* $\frac{1\cdot5}{3\cdot2}$; *f*^{la} ·2 × 25; *br* ·5 × ·2; *per* ·65 × ·35^{mm}.

Pusilla tenella viridis late effusa. Caules $\frac{1}{4}$-pollicares vage ramosi repentes, ramis assurgentibus, aliis parvifoliis.

Folia subcontigua majuscula plana, e lata basi late ovata vel ovato-rotunda obtusa rotundatave, basi subdecurrente obsolete complicata; cellulæ mediocres pellucidæ fere æquilateri-hexagonæ leptodermes, granis chlorophylli parvis vel in annulum angustum *viridem* congestis vel sparsis.

Foliola distantia, foliis triplo breviora, subrotunda, ultra medium bifida, segmentis lanceolatis acutis, radicellas plurimas divergentes proferentia.

Flores monoici: ♀ terminales innovatione simplice, raro prolifera—interdum cum duabus—suffulti. Bracteæ foliis subminores anguste obovato-lanceolatæ obtusæ elobulatæ; bracteola minor cuneato-lanceolata-ligulatave vix ad medium usque anguste bifida, segmentis conniventibus acutis.

Perianthia folia æquantia pyriformia vel subclavata, apice truncato brevirostria (rostello demum quinquefido) subcompressa, supra medium—vel tota fere longitudine—5-carinata, carinis apice rotundato paulo prominulis.

Androœcia ramulum cauligenum folio breviorem sistentia; bracteæ 3-jugæ parvæ.

L. pyriformis L. et G. (Mex. Leverm. 225) persimilis videretur, foliis autem subverticalibus, et foliolorum laciniis acuminatis diversa. "Stolonifera" dicitur, in nostra tamen rami parvifolii vix pro stolonibus habendi.

17. EU-LEJEUNEA INUNDATA, Spruce.

Hab. In arborum ramis et rupibus graniticis, aquis fluviorum *Negro* et *Uaupés* inundatis, in cataractarum vicinia præcipue.

F 1·0 × ·6, 1·25 × ·7; *lob* ·45 (*ad plicam* ·35); *c* $\frac{1}{3-\frac{1}{2}}$; *f*^{la} ·35 × ·1, ·375 × ·1; *br* ♂ ·4; *br* ♀ ·5 × ·35 (*explanatæ*); *per* ·6 × ·35^{mm}.

Caudex tenuis, matrici arcte adrepens, subdivisus, demum denudatus, caules prostratos pendulosve parallelos $\frac{1}{2}$–1-pollicem (in var. 3 pollices) longos, florescentiis utriusque sexus crebre pinnulatos, raro bipinnulatos, edens. Ramuli floriferi cuique folio basi adnati, ♂ cum ♀ sæpissime alternantes, hi (♀) cum suis perianthiis folium collaterale vix æquantes, illi (♂) foliis æquilongi vel sublongiores.

Folia subimbricata vel dissita, erecto-patentia patentiave, plana ligulato-ovalia vel subovato-elliptica rotundata, duplo fere (in var. triplo) longiora quam lata, a basi ad $\frac{1}{4}$–$\frac{1}{2}$ alt. complicata, dein biloba; lobulus 2–4-plo brevior, planus, cuneatus vel anguste triangularis, in apicem late subulatum acutum sæpe longe porrectus, interdum brevior et obtusus, margine supero unidentato muticove; cellulæ mediocres, paulo longiores quam latæ leptodermes.

Foliola dissita, foliis triplo breviora, caule vix latiora, linearia vel anguste cuneata, ab apice ad $\frac{2}{3}$ usque bifida; segmentis suberectis subulatis obtusiusculis, basi 4 cell. latis; radicellis suis albidis ad caules adjacentes arcte adhærentia, sæpe tamen arhiza.

Flores monoici. Rami ♀ brevissimi, innovando 1–3-flori, flore unico tamen (rarissime altero) fertili. Bracteæ foliis duplo breviores erecto-patentes cuneato-oblongæ complicatæ, ab apice at $\frac{1}{3}$ bilobæ, lobis subæqualibus ligulatis rotundatis; bracteola angusta, forma varia, sæpius subligulata breviter bifida.

Perianthia subemersa parvula brevi-pyriformia vel obovata, erostria, vix compressa, ab ipsa basi argute sed non alte 5-carinata, carinis papulosis apice subrotundo-prominulis. Capsula globosa exserta.

Androœcia lateralia ovata, plus minus elongata; bracteæ sæpius 3–5-(raro usque at 10-) jugæ, late ovatæ complicato-concavæ, apice vel rotundatæ integræque, vel breviter bilobæ, lobis rotundatis. Antheridia bina, altero sæpe deficiente.

Var. *saxorum.* (In saxis fluvii Negro inundatis.) Folia dissita late patentia, a basi ad medium usque complicata; lobulus folio solum duplo brevior angustiorque cuneato-trapezoideus rectangularisve, margine interno angulum fere rectum cum plica efficiente, supero subrotundato medium versus obtuse unidentato.

Var. *fontinaloides.* (TAB. X.) (Forma insignis, *Conomitrium Julianum* simu-

lans in arboribus ripariis inundatis vigens; fluvio crescente fluitans, quando autem fluvium resorbatur in se, e ramis altis, barbæ instar, pendula). Caules 3-pollicares et longiores. Folia distantia distiche patula, triplo longiora quam lata, ligulata, apice ex aquarum erosione sæpe semidestructa, profunde bipartita; lobulus parvus ad dentem folio 5–6-plo breviorem sæpe redactus, vel haud raro obsoletus. Foliola minuta, caulem latitudine vix æquantia, plerumque obliterata. Flores ♀ rari; bracteæ haud raro subacutæ. Andrœcia compresso-globosa, folio collaterali triplo breviora, bracteis sub 5-jugis, antheridiis binis. (= Lejeunea fontinaloides nobis olim in litt.).

Obs. Præter has formas, alias plures intermedias—nullam autem pro specie propria habendam—decerpsi.—Species distinctissima videtur. *L. spiniloba* L. et G. et *L. oxyloba* eorund. (Syn. Hep. 770; Gottsche in Mex. Leverm. 213) affines, certe differunt: foliis brevi-ovatis; foliolis multo majoribus (=½ folii), ovalibus; perianthiis lævissimis.

18. EU-LEJEUNEA SUFFRUTICOLA, Spruce.

Hab. Guataxi, Andium Quitensium, alt. 2200^{m}, in suffruticibus (Malvaceis, Solanis, etc.)

F ·75 × ·65, ·8 × ·7; *lob* ·15–·2; *c* $\frac{1}{45}$–$\frac{1}{40}$; f^{la} ·4 × ·3, ·5 × ·4; *br* ·5–·6; br^{la} ·5 × ·2; *per* ·75 × ·4^{mm}.

Mediocris, pallide viridis tenuis tenerrima, procumbens, substratificata. Caules 1–1½-pollicares laxe pinnatim ramosi, ramis monotrope innovandis v. dichotomis, aliis brevibus parvifoliis.

Folia dissita v. vix imbricata flaccida subplana, basi lata longitudinali inserta, angulo fere recto patula, late oblique ovato-oblonga rotundata, sinuato-expanda, basi antica dilatata subsemicordata, postica subrecte complicata; lobulus 4–5-plo brevior *subplanus*, subquadratus, margine sinuato, apice in lingulam obtusam protractus; cellulæ parvulæ subæquilateræ leptodermes pellucidæ, annulo opaco pertenui cinctæ. F. ramea 2–3-plo minora parum diversa, lobulis autem superioribus subinflatis.

Foliola vix duplo breviora, subappressa, ovali-rotunda, paulo ultra medium biloba, sinu obtuso, segmentis falcato-conniventibus acutis obtusisve.

Flores dioici (?): ♀ in ramis terminales, innovatione unilaterali prolifera, vel duabus oppositis, suffulti. Bracteæ foliis caulinis sat breviores inæquimagnæ erectæ, ad medium bifidæ complicatæ, lobis sublanceolatis obtusatis, lobulis paulo minoribus, altero obtuso, altero acuto; bracteola angusta obovato-lanceolata vix ad medium acute bifida, segmentis acutis.

Perianthia caulinis subæquilonga pellucida compressula obovata, ex apice rotundato-retusulo brevirostellata, 5-carinata, carinis lateralibus posticisque altis.

(Ad ramulorum apices adveniunt folia pauca parva subæquiloba, vacua tamen nec antheridiifera).

L. oxyloba L. et G. (Gottsch. Hep. Mex. 214) differt foliis imbricatis, lobulo duplo majore; foliolis pro ratione brevioribus; bracteis multo longioribus.

L. nemoralis, *sylvatica* et *montana* G. in Hep. Novo-Granat., species inter se forsan nimis affines, nostrati lobulo plano congruunt, diversæ autem foliis imbricatis, lobulo apice haud in dentem lingulatum producto, et (ut videtur) bracteis majoribus.

19. Eu-Lejeunea solanicola, Spruce.

Hab. Tarapoto, Andium Peruviæ, ad cortices *Solani* fruticosi.

F ·6 × ·4, ·5 × ·35; *lob* ·15 × ·1 ; *c* $\frac{1}{3^0}$; *f*^{la} ·3 × ·15; *br* ·5; *br*^{la} ·4 × ·125 ; *per* ·75 × ·4^{mm}.

Pusilla pallida uberrime fructifera. Caules 5^{mm} longi, pinnatim ramosi, prostrati, ramis assurgentibus paucifoliis.

Folia contigua vel subimbricata plana pellucida oblonga ovaliave apice rotundata, basi recte complicata; lobulus 4-plo brevior rhomboideus vel subrectangularis, plerumque planus, sinu subexcisus, apice in dentem subulatum porrectus; cellulæ parvulæ, inferiores folii axin versus submajores et elongatæ.

Foliola foliis duplo breviora, ovalia, ultra $\frac{1}{2}$ obtuse bifida, segmentis acutis basi 4 cell. latis.

Flores monoici: ♀ in ramo sæpe iteratim prolifero—innovationibus singulis oppositisve—terminales. Bracteæ foliis subminores erectæ complicato-bipartitæ, lobis æquilongis, antico ligulato-oblongo-obovatove obtusato, postico late subulato acuto; bracteola lanceolato-ligulata vel anguste cuneata, vix ad $\frac{1}{2}$ usque bifida.

Perianthia semiemersa pulchre diaphana pyriformia turbinatave, apice depresso brevirostria, supra medium alte 5-carinata, carinis posticis lateralibusque compressis acutis.

Andrœcia lateralia ovato-globosa; bracteæ sub 5-jugæ.

20. Eu-Lejeunea Artocarpi, Spruce.

Hab. San Carlos del Rio Negro, in *Artocarpi edulis* cortice.

F ·45 × ·35, *lob* ·15 × ·125, *c* $\frac{1}{4^0}$; *f*^{la} ·25 × ·2, ·15, ·2 × ·15; *br* ·45; *br*^{la} ·4 × ·2, *per* ·7 × ·4^{mm}.

Pusilla pallida, arcte repens, intricata; caules $\frac{1}{4}$-pollicares crebre inæqualiter ramosi subbipinnati.

Folia subimbricata, plana, axi paulo ascendente, late oblique ovata rotundata obtusatave recte complicata; *lobulus majusculus* (folio 3-plo brevior) *ovato-quadratus* v. *subrotundus* subacutus *fere planus* perpaulo inflatus; cellulæ subæquilateræ $\frac{1}{40}^{mm}$ tenues pellucidæ.

Foliola contigua subdissita, flores ♀ versus sensim majora, *dimidium folium æquantia* vel etiam *superantia*, ovali-rotunda, ultra medium bifida, segmentis lanceolatis acutis erecto-patulis 6 cell. basi latis; inferiora subduplo minora, magis profunde bifida, segmentis angustioribus.

Fl. *monoici*: ♂ terminales, innovatione suffulti. Bracteæ foliis æquilongæ oblique ovales ad medium bifidæ, altera subminor obtusata, lobulo subrhomboideo, altera (innovationi adnata) major subacuta, lobulo longiore subulata; bracteola lanceolato-oblonga, ad $\frac{1}{2}$ bifida, segmentis contiguis forficatisve acuminulatis.

Perianthia alte emersa obconico- pyriformia *retusa* vel *subobcordata* brevirostellata compressula, antice depressa 1-carinulata, postice altiuscule bicarinata, subpellucida lævissima.

Andrœcia sat robusta sæpe longispica; bracteæ 5–8-jugæ majusculæ *confertæ* turgidæ.

Eu-L. solanicola folia habet longiora angustiora ovalia; foliola laciniis lato-subulatis basi solum 4 c. latis; perianthiamagis acute carinata.

21. EU-LEJEUNEA SETILOBA, Spruce.

Hab. *Manaos*, juxta fluvii *Negro* ostia, in cortice.

F ·55 × ·4, ·4 × ·3; *lob* ·1; *c* $\frac{1}{44}$; f^{la} ·15 × ·1; *br* ·5; br^{la} ·45 × ·2; *per* ·65 × ·5; ·4 × ·3mm.

Pusilla pallida tenella prostrata. Caules $\frac{1}{4}$ pollicis longi, paralleli vel subintexti, paulo et subpinnatim ramosi.

Folia subdissita contiguave oblique oblonga ovaliave obtusata vel rotundata, basi angustissime complicata, plicâ processum (lobulum verum) subulatum 4 cellulas longum, cauli parallelum fereque contiguum, proferente; cellulæ parvulæ æquilateræ pellucidæ subconformes, solum marginales quadratæ subminoresque.

Foliola foliis 4-plo fere minora, caule vix latiora, oblonga, ad $\frac{1}{2}$ anguste bifida, segmentis lanceolatis acutis.

Flores monoici: ♀ crebri, in ramo sæpe perbrevi terminales, innovatione (raro proliferâ) suffulti. Bracteæ foliis subæquales, subpatulæ, ultra $\frac{1}{2}$ bilobæ, lobo obovato-lanceolato obtusato, lobulo subæquilongo duplo angustiore acuto; bracteola lanceolato-oblonga ad $\frac{1}{2}$ bifida, segmentis subcontiguis acutis.

Perianthia subemersa turgide-vel globoso-pyriformia turbinatave, vix compressa, brevissime rostellata, pellucida, alte 5-carinata, carinis complanatis sublævissimis. Capsula in pedicello longo geniculato-articulato exserta.

Amenta ♂ cauligena folio collaterali æquilonga; bracteæ 2–3-jugæ majusculæ turgidæ cymbiformes.

Pulcherrima et distinctissima species, habitu *Cheilo-Lejeuneæ aneogynæ* similis, caractere longe divergens. *Eu-L. muscicola*, magis affinis, folia habet lobulo dentiformi brevissimo fere obsoleto, cellulis submajoribus; foliola præminuta rotunda; bracteas bipartitas, lobulo ad dentem redacto; bracteolam brevissime bifidam; perianthia angustiora.—*Eu-L. læta* L. et L. folia habet sæpius acutiuscula elobulata; foliola ultra $\frac{1}{2}$ biloba.

22. EU-LEJEUNEA MUSCICOLA, Spruce.

Hab. Ad flumen Amazonum juxta *Santarem*, in cortice supra muscos repens.

F ·6 × ·5, ·6 × ·45; *c* $\frac{1}{352}$; f^{la} ·1 × ·1; *br* ·4–·55; br^{la} ·3 × ·15; *per* ·65 × ·35; ·8 × ·5mm.

Pallide viridis, tenera, matrici laxo cæspite arcte adhærens. Caules $\frac{1}{2}$-pollicares flexuosi vage ramosi.

Folia dissita vel subimbricata, plana vel apice decurvula, late oblique ovata, rotundata rarius obtusata, basi antica dilatata (vix semicordata), postica decurrente obsolete vel saltem angustissime complicata, plicâ medio dentem brevem obtusum 1–2 cell. altum proferente; cellulæ mediocres pellucidæ subconformes, marginales parum minores obscure crenulato-prominulæ.

Foliola distantia minuta, foliis 6-plo breviora rotunda, ad medium bifida, segmentis acutis.

Fl. monoici: ♀ in ramo perbrevi terminales, innovatione parvifolia (sæpe ♂) suffulti; bracteæ longitudine variæ, semper foliis breviores, appressæ, bipartitæ, lobo oblique lanceolato obtuso, lobulo parvo dentiformi acuto, bracteola longe brevior, ovali-lanceolata, apice brevissime bifida, segmentis subacutis.

Perianthia emersa, foliis caulinis tamen vix sublongiora, pyriformi-oblonga, parum compressa, apice rotundato-truncato obsolete rostellata, 5-carinata, carinis subpapulosis, demum (capsula egressa) subcampanulata, ore breviter 4–5-fida.

Andrœcia sæpius ramulum proprium, breviorem longioremve, sistentia; bracteæ mediocres turgidæ 3–8-jugæ.

L. L. glaucescenti G. et *Chamissonis* Lindenb. affinis, ab utraque diversa.

Var. *palmicola* S. (*Eu-Lejeunea palmicola*, Spruce Mst.)

Hab. Parâ, in palmarum truncis, supra muscos repens.

F ·65 × ·55; *c* $\frac{1}{3}$–$\frac{1}{5}$; *f*^{la} ·15–·15, ·2 × ·2; *br* ·65; *br*^{la} ·5 × ·3; *per* ·65 × ·4, ·5 × ·3; *br* ♂ ·125^{mm}.

A *L. muscicola* typica differt caule crassiore, fragili tamen. Folia omnia subimbricata, fere dimidiata, lobulo minuto triangulari rhombeove sæpius mutico, interdum obsoleto; cellulæ subconformes, marginem versus sensim paulo minores, subbasales paulo majores, omnes subplanæ leptodermes pellucidæ. Foliola paulo majora, vix ad medium fissa, segmentis obtusis. Bracteæ lobulo perangusto lineari-lanceolato acuto, lobo duplo breviore; bracteola obovata, ad $\frac{1}{3}$ fissa. Perianthia obovata, supra medium 5-carinata, vix rostellata, carinis superne dilatatis, rotundato-prominulis vix papulosis. Bracteæ andrœcii rigidiusculi sæpe incurvi f. caulinis 5-plo minores subconfertæ subrotundæ.

23. EU-LEJEUNEA SUBSESSILIS, Spruce.

Hab. Fl. *Bombonasa*, in folio vivo.

F ·8 × ·75; *c* $\frac{1}{30}$; *f*^{la} ·2 × ·2, ·15 × ·15; *br. lobus* ·45 × ·1; *br*^{la} ·35 × ·1; *per* ·6 × ·3; *br* ♂ ·1^{mm}.

Pallida flaccida tenerrima. Caules pollicares prostrati vage vel subpinnatim ramosi, ramis pro more brevibus sæpe floriferis, paucis longioribus ramulosis.

Folia parum imbricata majuscula subplana, basi elongata inserta, oblique late ovata abrupte subacuta obtusave obscure celluloso-crenulata integerrimave, obsolete lobulata; cellulæ mediocres leptodermes fere vacuæ, subplanæ.

Foliola 4–5-plo minora rotunda ad medium bifida, segmentis acutis obtusisve.

Flores monoici: ♀ ad caulem v. ramum primarium in ramulo brevissimo, foliolo unico radicante folioque unico parvo (nullove) stipato, terminales, innovatione brevi simplice suffulti. Bracteæ foliis subduplo minores ligulato-lanceolatæ obtusæ subelobulatæ; bracteola ligulata tenerrima brevissime bifida v. fere integra.

Perianthia emersa, f. caulino breviora, brevi-clavata parum compressula, longirostria, 5-carinata, carinis apice insigniter truncatis lævibus.

Amenta cauligena folio subbreviora tenuia rigidiuscula; bracteæ 5-8-jugæ confertæ f. caulinis 8-plo breviores turgidæ.

Habitu cum Taxi-Lejeuneis convenit, ramo ♀ autem constanter uniflоro foliolis parvis distat.

24. EU-LEJEUNEA TARAPOTENSIS, Spruce.

Hab. Andes Peruvianos, juxta *Tarapoto*, ad arbores vetustas; etiam in montibus vicinis supra filices.

F ·75×·5; *c* $\frac{1}{3-5}$; f^{la} ·2×·3, ·15×·25, ·15×·15; *br* ·35–·5 *longæ*; *per* ·75×·375, ·9×·4mm.

Mediocris, pallide virens, siccando fuscescens. Caules ½-pollicares prostrati implexi pellucidi tenaces arcte radicati, vage ramosi, in cæspitis ambitu pinnati, ramis ♂ cum ♀ sæpe alternantibus, assurgentibus, sterilibus arcuato-decurvis.

Folia subimbricata, rarius dissita, patulo-decurva vel varie undulata tortaque, obliqua, interdum subfalcata, ovato-oblonga v. semiobovata, rotundata, basi decurrentia, lobulo obsoletissimo v. 0; cellulæ mediocres parum elongatæ, leptodermes, sat crassæ, parce chlorophyllosæ, fere planissimæ.

Foliola minuta, foliis 4–5-plo breviora subrotunda, sæpe oblata, ad ½ bifida, segmentis acutis obtusisve.

Flores monoici: ♀ in ramulo brevissimo terminales, innovatione simplice suffulti. Bracteæ parvæ forma variæ, sæpius oblongæ ligulatæve obtusæ, altera elobulata, altera lobulo parvo cum bracteola cuneato-oblonga bifida basi connato.

Perianthia alte emersa anguste obconico-pyriformia, subcompressa, apice retusulo v. subobcordato brevirostellata, 5-carinata, carinis apice rotundato-prominulo papulosis, fructu emerso campanulata 4-fida.

Androecia tenuia oligo-polyphylla subincurva, sæpissime ramulum totum tenentia; bracteæ confertæ ovoideo-cymbiformes parum inæquilobæ, antheridium solitarium magnum foventes.

25. EU-LEJEUNEA CORDIFLORA, Spruce.

Hab. Fl. *Uaupés*, in *Gomphiæ* sp. folio.

F ·5×·4, *lob* ·125; *c* $\frac{1}{4-5}$–$\frac{1}{5-0}$; f^{la} ·25×·25, ·3×·35; *br* ·55; br^{la} ·45×·25; *per* ·65×·4mm.

Mediocris, prostrata, pallide viridis, siccando subolivacea. Caules ½-poll. vage subpinnatim ramosi, in plagulam densam intexti.

Folia late patentia subimbricata, fere plana, apice decurvula interdum recurvula, late oblique ovato-oblonga rotundata, basin versus recte complicata; lobulus 4-plo brevior inflatus subovoideus apice pro more occulto; cellulæ parvæ subconformes vix incrassatæ, ambitu subopacæ.

Foliola foliis vix duplo minora orbiculata, vix ad ½ obtuse bifida, rima angusta, segmentis obtusis acutisve.

Flores monoici: ♀ in caule ramisque innovando-proliferis terminales. Bracteæ foliis subæquales, complicato-bilobæ, lobis apice variis sæpe rotundatis, anticis lanceolatis, posticis duplo minoribus ligulatis; bracteola ovalis ad ⅓ bifida, segmentis contiguis forficatisve subacuminatis, superne angulata v. subdenticulata.

Perianthia subemersa obcordato-pyramidata, sat compressa, antice depressa, postice humiliter bicarinata, margine supero repandulo (raro rudimentarie alato), apice emarginato tenui-rostellata.

Amenta ♂ cauligena folium superantia; bracteæ sub 5-jugæ majusculæ laxiusculæ.

A *L. flava* perianthiis conspicue compressis, obcordatis, et foliis recte lobulatis certe distat, habitu tamen simillima.

26. EU-LEJEUNEA CAUAPUNENSIS, Spruce.

Ad rivulum *Cauapuna*, fl. *Negro* tributarium, in arboris folio, cum aliis *Lejeuneis*.

F ·5×·4, ·5×·35, *lob* ·1–·15, *c* $\frac{1}{2-8}$; f^{la} ·15×·125, ·125×·125; *br* ·5; br^{la} ·45×·15; *per* ·8×·55, ·7×·42mm.

Tenella flavida, pellucida arcte repens; caules pollicares valde et vage ramosi.

Folia contigua vel subimbricata falcato-oblonga v. ovato-oblonga rotundata, basi subsinuato-complicata; lobulus ovatus subsaccatus, apice sæpius inflexo occultoque, raro ad plicam parvam redactus; cellulæ mediocres pellucidæ, marginales distincte minores quadratæ.

Foliola distantia subrotunda folio 4-plo breviora ad medium acute bifida, segmentis plerumque patulis acutis, medio margine exteriore angulata (ideo subrhombea).

Fl. monoici: ♀ terminales, innovatione suffulti. Bracteæ foliis subæquales oblique oblongæ rotundatæ ad $\frac{3}{4}$ bifidæ, lobulo triangulari subulatove acuto; bracteola cuneato-lanceolata, 3-plo longior quam lata, ad medium bifida, segmentis erectis subulatis acutis, utrinque medio unidentata, tenuissima.

Perianthia pro plantula magna pellucida obcordato-cuneata valde compressa, tenui-rostellata, antice depressa postice bicarinata lævia.

Amenta ♂ terminalia ovata; bracteæ 3-jugæ.

Species pulchella!—*L. drymophila*, proxima, foliola habet bipartita et andrœcia lateralia. *L. Canapunensis* ab omnibus affinibus parvistipulis differt colore flavescente, perianthiis profunde obcordatis, simul ac foliolis rotundis ad dimidium solum bifidis.

27. EU-LEJEUNEA SICCATA, Spruce.

Hab. Pará, in truncis putridis.

F ·6×·45, ·75×·65; *lob* ·125; *c* $\frac{1}{30}$; f^{la} ·15×·1, ·1×·1; *br* ·4×·125; br^{la} ·3×·15; *per* ·65×·45mm.

Tenella albida pellucida, post siccationem difficillime emollitura. Caules $\frac{1}{6}$-pollicares arcte repentes vage ramosi, ramis paucifoliis raro elongatis, aliis a matrice subliberis arcuatis.

Folia ad $\frac{1}{3}$ v. fere ad $\frac{1}{2}$ lat. imbricata late patentia, apice decurva, dimidiata, semiovata, rotundata, rarius obtusa, basi antica dilatata subsemicordata caulem late transeuntia, subpapulosa, margine cellulosocrenulata, subrecte complicata; lobulus sub 5-plo brevior fere transversus ovoideus; cellulæ mediocres subconformes, ad angulos incrassatæ, chlorophyllo parco sparso.

Foliola foliis 4–6-plo breviora subrotunda ad $\frac{1}{2}$ bifida, segmentis obtusis acutisve.

Flores monoici: ♀ in ramo brevi terminales, innovatione (simplice v. proliferâ) suffulti. Bracteæ *perparvæ*, foliis fere duplo minores, profunde bilobæ, lobo lineari-oblongo acuto obtusove, lobulo multo minore subulato; bracteola ovalis breviter acute bifida; omnes bracteæ crenulatæ.

Perianthia ex involucro alte emersa, foliis caulinis autem vix longiora, obovata compressa, antice depressa solum apicem versus carinulata, postice turgidiuscula bicarinata, margine supra medium dilatata compressaque unde rotundato-truncata — raro subobcordata — evadunt, carinis omnibus cellulis pellucidis papulosis, rostello brevissimo, fructu egresso 3-labiata, labiis brevissime apiculatis.

Amenta ♂ cauligena, foliis breviora; bracteæ sub 3-jugæ laxe æquitantes.

L. Cauapunensis S. distincta erit foliis minoribus falcatis; foliolis bracteolisque medio margine utrinque angulato-unidentatis; perianthiis majoribus obcordatis insigniter pellucidis.

28. Eu-Lejeunea drymophila, Spruce.

Hab. Ad fl. Amazonum et præcipue ad fluvios *Negro* et *Uaupés*; necnon in Andium radicibus, ad alt. 500m. usque, locis *Tarapoto* et fl. *Bombonasa* ripis, in arborum cortice, raro in Melastomacearum Palmarumque foliis vivis.

F ·4×·3, ·4×·35; *lob* ·1 v ·0; *c* $\frac{1}{35}$; *f*^{la} ·15×·08, ·1×·75; *br* ·45; *br*^{la} ·35×·13; *per* ·6×·4^{mm}.

Pusilla pallide viridis, denso strato repens, tenuissima. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicares vage v. pinnatim divisi, ramis subdivergentibus paucifoliis apice angustatis.

Folia subcontigua, angulo axiali 70° patula, a basi lata late oblique (vel subsemi) ovato-oblonga, rotundata obtusave rarius subacuta; lobulus rectus folio 4-plo brevior ovato-rhombeus inflatus, sæpe obsoletus; cellulæ mediocres pellucidæ, chlorophyllo parco sparso, plerumque leptodermes, in pl. foliicolis autem ad angulos sæpeque ad media latera incrassatæ, subplanæ.

Foliola foliis sub 3-plo breviora, squarrosula, ovalia v. subcuneata, ultra $\frac{1}{2}$ bifida, segmentis subulatis basi 3–4c. latis.

Flores monoici: ♀ in ramo brevissimo terminales, innovatione simplice suffulti. Bracteæ suberectæ, foliis subæquilongæ, oblique ovali-lanceolatæ acutæ obtusæve, ad $\frac{1}{3}$ bilobæ, complicatæ, lobulo longe minore lingulato v. subulato; bracteola longe lanceolata, fere 3-plo longior quam lata, ad $\frac{1}{3}$–$\frac{1}{2}$ acute bifida, segmentis lanceolato-subulatis acutatis.

Perianthia emersa, f. caulinis $\frac{1}{2}$ longiora, obcordato-cuneata-pyriformiave, compressa rostellata, antice depressa, postice obtuse bicarinata (demum late unicarinata) margine subtuberculosa læviave, interdum apicem versus ala angusta 1–2c. lata, aucta.

Androecia folio caulino breviora (in var. longiora); bracteæ 2–3-jugæ parvæ cymbiformes.

Var. *macrostachya* (=*L. macrostachya* Spruce Mst.): ad fluvios *Uaupés* et *Bombonasa*.—Magis ramosa subbipinnata; androeciis elongatis, bracteis 5–18-jugis; foliorum cellulis subminoribus, $\frac{1}{44}$–$\frac{1}{40}$^{mm}.

29. Eu-Lejeunea orbicularis, Spruce.

Hab. Fl. *Negro*, ad *Saõ Gabriel da cachoeira*, in cortice.

F ·38×·25; *c* $\frac{1}{40}$; *f*^{la} ·1×·08; *br* ·38; *per* ·6×·35^{mm}.

Pusilla albescens prostrata, plagas orbiculares sistens, floribunda. Caules $\frac{1}{8}$–$\frac{1}{4}$-pollicares, vage ramosi implexi, ramis paucifoliis.

Folia subcontigua oblique ovato-oblonga rotundata obtusatave, basi postica minutissime inflexa, lobulo sæpius 0; cellulæ parvulæ subconformes æquilateræ diaphanæ. Raro advenit folium unum alterumve lobulo rhombeo subinflato auctum.

Foliola remota, foliis 4-plo fere minora, ovata, ultra $\frac{1}{2}$ acute bifida, segmentis acutis subulatis basi 3 cellulas latis.

Flores monoici: ♀ terminales, cum innovatione. Bracteæ foliis æquilongæ erectæ, lobo obovato acuto obtusove, lobulo multo angustiore lanceolato acuto; bracteola ovalis breviter bifida.

Perianthia alte emersa pyriformia compressula, antice plana vel obscure carinulata, postice bicarinata, carinis obtusis (haud raro in unam latam confluentibus), apice rotundata retusave—vix obcordata—brevirostria, demum 2–3-valvia.
Androecia terminalia et lateralia, folium caulinum subexcedentia, julacea, bracteis majusculis 5-jugis.

Foliis minoribus paulo longioribus; perianthiis pro ratione majoribus, longioribus et minus compressis, apice haud obcordatis, a *L. drymophila* distincta.—*L. trinitensis* Lindenb. folia habet rotundo-ovata obtusa, bracteas longiores et perianthia latiora subimmersa.

30. EU-LEJEUNEA LIMBATA, Spruce.

Hab. S. Gabriel fl. *Negro*, in foliis vivis.

F ·5 × ·4; *lob* ·1; *c* $\frac{1}{2}\frac{1}{5}$ (*marginales* $\frac{1}{5}\frac{1}{5}$); f^{la} ·18 × ·1; *br* ·35; br^{la} ·3 × ·125; *per* ·65 × ·5^{mm}.

Pusilla arcte repens, viridis, siccando pallida. Caules pollicares sparsi, pinnati vel vage ramosi, ramis pro more paucifoliis.
Folia subcontigua oblique oblonga rotundata—vel rhomboidea, angulis rotundatis– raro solam obtusata, margine repanda, basi decurrente lobulata (vel sæpe non); lobulus 5-plo brevior oblique ovatus inflatus; cellulæ pellucidissimæ, mediæ fere majusculæ, marginales plus duplo minores (unde folia *marginata* evadunt).
Foliola dissita, foliis triplo minora, cauli appressa, anguste ovalia vel subcuneata, ultra $\frac{1}{2}$ bifida, laciniis suberectis lineari-subulatis obtusis, basi 2–3 cellulas latis.
Flores monoici: ♀ in ramo brevi terminales, innovatione simplice suffulti. Bracteæ foliis minores, ad basin fere usque bipartitæ, lobo oblique obovato ovalive obtusato, lobulo parvo lineari diagonali; bracteola angusta cuneato-ligulata, ad $\frac{1}{3}$ acute bifida, segmentis acutis.
Perianthia alte emersa, foliis caulinis longiora, diaphana (unde, e calyptrâ coloratâ, flavida videntur) turbinata vel late triangulari-pyriformia rotundato-retusa, brevirostria sat compressa, antice carinulata, postice bicarinata—rarissime margine subalata.
Androecia in ramis terminalia; bracteæ 3–5-jugæ turgidæ.

Teneritate, colore viridi; foliis rhomboideo-oblongis, cellulis marginalibus minutulis quadratis (pro more discoloribus); foliolis foliis vix triplo minoribus; perianthiis diaphanis triangularibus rotundato-retusis, rostello brevi tenui, ab affinibus distincta.

SUBGENUS XXXIV.—*MICRO-LEJEUNEA*, S.

Eu-Lejeuneis microstipis, habitu sat similis, differt statura imo humiliore et caracteribus sequentibus.—Folia minuta (·15–·4^{mm} longa), semper fere dissita, integerrima vel parum celluloso-crenulata, textura firmiore et densiore, cellulis $\frac{1}{5}\frac{1}{0}$–$\frac{1}{8}\frac{1}{0}^{mm}$, e chlorophyllo copioso sæpius subopacis, lobulo semper fere majore magisque turgido, in paucis speciebus lobum fere æquante. Foliola segmentis constanter subulatis. Florescentia omnium fere dioica; in *Microstipis* e contra omnes fere species monoicæ sunt.

Hab. In cortice et in foliis vivis, rarius in saxis, sæpe aliis hepaticis et muscis irrepentes; loca sylvatica tam planitiei quam montium diligentes.

Distr. Species sub 16 hucusque cognitæ omnes fere neotropicæ, una autem in insula Java (*L. cucullata* N.), altera (*L. punctiformis* Tayl.) in India, 2 in Europa occidentali et America boreali temperata (sc. *L. ulicina* Tayl. et *L. diversiloba* Spruce) crescunt. In Amazonia, et in Andibus, occidentalibus præcipue, 6 species legi, quarum una sola (*L. lucens* Tayl.) antea descripta fuerit.

A. *Folia lobulo mediocri parvove aucta.*

a. *Flores dioici.*

1. *Micro-L. lucens.* Albicans parce ramosa, interdum ramulis parvifoliis pinnulata. F. angulo 60° patentia ovato-oblonga subsemicordata apice rotundata, recte complicata, lobulo 2–3-plo breviore, nunc obsoleto, c. $\frac{1}{50}^{mm}$. Foliola 2-plo breviora ovali-rotunda ultra $\frac{1}{2}$ bifida, segmentis late subulatis acutis. Br. parum inæquilobæ obtusæ acutæve; bracteola ovali-lanceolata bifida. Per. subemersa late pyriformia turgidiuscula.

[*Micro-L. cucullata* N. Pallide viridis parce et subfastigiatim ramosa. F. subimbricata, inferiora erectiora brevioraque, superiora angulo 70° patentia, ovato-rotunda, lobulo duplo breviore turgido interdum apiculato, c. $\frac{1}{65}^{mm}$. Foliola 2-plo breviora ovali-rotunda ad $\frac{1}{2}$ bifida, segmentis subobtusis. Br. foliis multo longiores, lobo subrotundato, lobulo sat breviore angusto; bracteola ovalis vix ad $\frac{1}{2}$ bifida. (Per emersa obovata compressa apicem versus 5-carinata). *Java.*]

[*Micro-L diversiloba* S. Fulvo-viridis pauciramosa, caule ramisque filiformibus subparallelis. F. subcontigua angulo 30° erecto-patentia, obovato-oblonga rotundata raro subacuta, lobulo 2-plo breviore subinflato acuto, interdum minuto obsoletove, c. $\frac{1}{65}^{mm}$. Foliola 4-plo minora subrotunda ultra $\frac{1}{2}$ bifida, segmentis acutis. Br. foliis sublongiores, lobo subacuto, lobulo subæquilongo angustiore; bracteola obovato-lanceolata ultra $\frac{1}{2}$ bifida. *Hibernia.*]

2. *Micro-L. subrufula.* Rufescens subpinnata. F. dissita erecto-patentia ovato-lanceolata subacuta, lobulo vix 3-plo breviore inflato apiculato, c. $\frac{1}{50}^{mm}$. Foliola plus 3-plo minora ovata ultra $\frac{1}{2}$ bifida, segmentis subulatis.

3. *Micro-L. perpusilla.* Minuta pallida subramosa. F. dissita erecto-patentia ovato-triangularia subacuta, lobulo $\frac{1}{2}$ folium superante saccato acuto, c. minutis. Foliola 4-plo minora profunde bifida, segmentis lato-subulatis. Br. foliis fere duplo longiores, lobo falcato-rhomboideo, lobulo duplo angustiore; bracteola late ligulata bifida.

4 *Micro-L. bullata*, a priore differt foliis duplo minoribus ovatis obtusatis, lobulo lobum fere æquante, cellulis præminutis; bracteis erectis. Perianthia alte emersa pyriformia alte 5-carinata. (Videas etiam ad pedem sectionis sequentis.)

5. *Micro-L. aphanes.* Pallide fulva tenui-ramosa. F. subdissita late patentia ovata rotundata, lobulo 3-plo breviore turgido, c. parvis ($\frac{1}{50}^{mm}$). Foliola minuta, foliis 7-plo breviora oblonga ultra $\frac{1}{2}$ bifida. Br. foliis minores, lobis subæquilongis, inferiore anguste lineari; bracteola anguste oblonga apice apiculato-bidentata. Per. subemersa obovata compressula altiuscule 5-carinata.

b. *Flores monoici.*

6. *Micro-L. aphanella.* Minuta rufa subcæspitosa. F. distantia late patentia ovato-lanceolata subacuta subintegerrima, lobulo duplo breviore subinflato interdum obsoleto, cellulis minutulis planis, paucis ad carinam marginemque convexis. Foliola minuta 4 c. longa bipartita, cruribus subulatis. Br. foliis 2-plo longiores, acutæ; bracteola lanceolato-oblonga vix ad $\frac{1}{2}$ bifida. Per. magna obovata turgida, carinis superne papulosis.
7. *Micro-L. pusilla.* Albicans subpinnata. F. subcontigua patentia ovato-ovalia rotundata valde sinuato-complicata, lobulo plus duplo breviore turgido, c. parvis. Foliola 4-plo minora cuneato-rotunda, vix ad $\frac{1}{3}$ bifida, segmentis obtusis. Br. foliis æquales acutæ obtusæve; bracteola cuneato-lanceolata ad $\frac{1}{3}$ bifida. Per. alte emersa pyriformia subcompressa prælte 5-carinata lævia.

B. *Folia fere tota convoluta, conchoidea.* Dioicæ.

[*Micro-L. ulicina* T. Viridis vage ramosa. F. subdissit arotundo-ovata concava sæpius subacuta subpapulosa a basi ad $\frac{3}{4}$ alt., vel fere ad apicem usque, complicata, lobulo subangustiore acuto, cellulis minutulis convexis. Foliola 3-plo breviora ovalia ultra $\frac{1}{2}$ bifida, segmentis lineari-subulatis. Br. maximæ foliis 2–3-plo majores, patulæ, complicato-bilobæ, ad carinam anguste alatæ, lobis acutis, inferiore subminore, erosulis v. subdenticulatis; bracteola oblonga ad $\frac{1}{4}$ bifida, segmentis acutis. *Europa.*]
4. *Micro-L. bullata.* Tenuissima subramosa. F. distantia suberecta tota fere convoluta ovoideo-conchoidea, lobo obtusato, lobulo parum breviore subacuto, c. præminutis convexis. Foliola minuta caule abscondita profunde bifida, segmentis linearibus subulatisve erectis. Br. magnæ exalatæ integerrimæ. Per. alte emersa pyriformia alte 5-carinata.

1. MICRO-LEJEUNEA LUCENS, Tayl.!

In Lond. Journ. Bot. (1846), p. 399. Syn. Hep. 764.

Hab. Ad fluvium *Guamá* prope *Pará*, in palmarum truncis. *Tarapoto*, Andium Peruviæ, ad arborum pedem. "*Pará*, in cortice" (T. L. R.! in hb. Hook.)

F ·4×·32, ·3×·2; *lob* ·1–·15; *c* $\frac{1}{55}$–$\frac{1}{50}$; f^{la} ·15×·1; *br* ·5; br^{la} ·5×·25; *per* ·5×·3^{mm}.

Pusilla pulchre albicans late effusa, in sicco immutata haud facile emollitura. Caules 4^{mm} longi parce et vage ramosi, interdum ramulis parvifoliis assurgentibus deciduis pinnulati.

Folia subdissita subplana, angulo 60° a caule patentia, oblique ovato-subtriangularia—ramea ovato-oblonga—rotundata obtusatave, basi subsemicordata, subrecte complicata; lobulus 2–3-plo brevior subsaccatus, subquadratus sed e convolutione ovatus, apice brevi vel in dentem longiusculum protracto, haud raro obsoletus; cellulæ parvæ hexagonæ subconformes lævissimæ pellucidæ, ambitu anguste opacæ.

Foliola subdissita, foliis plus duplo breviora, ovali-rotunda tenerrima vitrea, interdum utrinque unidentata, apice paulo ultra medium subobtuse bifida, segmentis late subulatis acutis, basi 3–4 cell. latis.

Flores dioici: ♀ in caule ramove innovando-prolifero terminales. Bracteæ foliis sublongiores erectæ complicatæ, ad $\frac{1}{2}$ fere bilobæ, lobis parum

inæqualibus lanceolatis obtusis acutisve; bracteola æquilonga ovali-lanceolata bifida, segmentis acutis.
Perianthia vix emersa late pyriformia brevirostria, parum compressa, 5-carinata, carinis lævissimis.
Andrœcia basin rami longioris tenentia julacea; bracteæ 5–6-jugæ foliis æquimagnæ turgidæ, lobulo dimidium lobum æquante.

Planta Tarapotensis subminor est, foliis interdum subacutis, persæpe elobulatis.

2. MICRO-LEJEUNEA SUBRUFULA, Spruce.

Hab. *Chimborazo*, in arboris folio vivo, sterilis.

F ·4×·25; *lob* ·15; *c* $\frac{1}{50}$; *f*^{la} ·125×·1^{mm}.

Pusilla repens rufescens. Caules semipollicares laxe subpinnati.
Folia dissita erecto-patentia ovato-lanceolata subacuta subrecte complicata; lobulus vix triplo ovoideus inflatus apiculato-acutus; cellulæ parvæ fere planissimæ ambitu subopacæ, pariete vix incrassato.
Foliola foliis plus triplo minora ovata, ultra $\frac{1}{2}$ bifida, segmentis subulatis.

Ab hac distat Micro-*L. perpusilla* minutie, foliis duplo minoribus ovato-triangularibus, lobulo magno; foliolis plus duplo minoribus; cellulis minutis.

3. MICRO-LEJEUNEA PERPUSILLA, Spruce.

Hab. In monte *Azuay* Andium Quitensium, supra *L. pallescentem* Mitt. repens.

F ·2×·125; *lob.* 125–·15; *c* $\frac{1}{70}$; *f*^{la} ·05; *br* (*lob*) ·35×·1^{mm}.

Minuta pallida. Caules 3^{mm} longi, parum ramosi.
Folia dissita erecto-patentia ovato-triangularia-rhomboideave acuta obtusave, recte complicata; lobulus dimidium folium superans, saccatus, apice brevi acuto occulto; cellulæ minutæ subelongatæ planæ pellucidæ leptodermes.
Foliola minuta, foliis 4-plo minora, profunde bifida, segmentis late subulatis 3 cellulas (elongatas) longis, basi 3 c. latis.
Flores dioici: ♀ terminales, cum innovatione simplice. Bracteæ foliis duplo fere longiores complicatæ breviter bilobæ, lobo falcato-rhomboideo, lobulo duplo angustiore lineari vel subcuneato; bracteola late ligulata bifida.
Differt a *Micro-L. pusilla* floribus dioicis; foliis duplo fere minoribus subacutis (nec rotundatis), lobulo pro ratione majore, cellulis minutis; foliolis angustioribus.

4. MICRO-LEJEUNEA BULLATA, Tayl.!
Lond. Journ. Bot. 1846, p. 398. Syn. Hep. 767.

Hab. In Andibus Quitensibus sylvaticis, locis *Rio Verde* ad pedem montis *Tunguragua; Chimborazo; Azuay;* in ramis supra alias Lejeuneas, Frullanias, etc. repens: rara et rarissime fertilis. Insula S. Vincentii (GUILDING! in hb. Hook.).

F ·1×·07, *c* $\frac{1}{100}$; *f*^{la} ·03–·05; *br* ·25; *per* ·4×·2^{mm}.

Pallida tenerrima prostrata sparsa. Caules $\frac{1}{8}$-pollicares filiformes parum ramosi, ramique flexuosi.

Folia distantia suberecta oblique ovata obtusata, cum lobulo conchæformi-concava, subpapulosa; lobulus folii $\frac{2}{3}$ æquans superansve, lobo æquilatus, bullatus, margine incurvus, apice brevi-acutus; cellulæ præminutæ leptodermes pellucidæ subprominulæ.

Foliola foliis 2–3-plo breviora obovata, ad vel ultra $\frac{1}{2}$ bifida, segmentis lato-subulatis acutis.

Flores dioici: ♀ terminales, innovatione suffulti. Bracteæ foliis plus duplo longiores suberectæ complicatæ breviter bifidæ, lobis obovatis subinæqualibus; bracteola basi utrinque connata oblonga bifida (manca solum visa).

Perianthia foliis 4-plo longiora pyriformia rostellata alte 5-carinata lævia.

Androecia medio caule ramove posita; bracteæ sub 3-jugæ, *foliis majores*, æquilobæ.

Obs. Specimina originalia Taylori in herb. Hook. haud differunt nisi foliolis paulo profundius fissis: ex ins. S. Vincentii proveniunt. *L. punctiformis* Tayl., l. c., ex India orientali, probabiliter conspecifica erit. *L. perpusilla* nostra folia habet duplo longiora persæpe acuta, foliola autem vix majora quam in *L. bullata*.

5. MICRO-LEJEUNEA APHANES, Spruce.

Hab. Ad fl. *Casiquiari*, in truncis inundatis supra muscos repens.

F ·35 × ·2; *lob* ·125; *c* $\frac{1}{50}$; *f*^{la} ·05 × ·04; *br* (*lobus*) ·25; *br*^{la} ·2 × ·1; *per* ·4 × ·3^{mm}.

Pusilla pallide fulva; caules $\frac{1}{2}$ pollicares subramosi, ramique tenues elongati laxifolii.

Folia dissita v. subcontigua, axi angulo 60°–80° patente, oblique ovata (in situ obovata videntur) rotundata, subrecte complicata, lobulus 3-plo brevior ovato-rotundus turgidus, apice acuto sæpius occulto; cellulæ parvæ leptodermes subpellucidæ subplanæ.

Foliola minuta, foliis 7-plo minora, caule occulta, oblonga vel obovata, ultra medium bifida, segmentis late subulatis acutis.

Flores dioici: ♀ in ramo breviusculo terminales, innovatione simplice suffulti; *bracteæ foliis minores* complicatæ, lobis oblique obovatis rotundatis (v. altero subacuto), lobulis subbrevioribus linearibus; bracteola anguste oblonga apice apiculato-bidentata.

Perianthia subemersa obovata subrostellata compressula altiuscule 5-carinata, carinis lævibus.

L. radicans L. et G., subsimilis, folia habet solum obtusa, lobulo interdum deficiente, bracteas ad apicem fere usque integras, et bracteolam foliolis conformem.

6. MICRO-LEJEUNEA APHANELLA, Spruce.

Hab. In arborum cortice secus flumen *Negro*, haud infrequens, locis *Manáos*, *Marabitanas*, aliisque, ob minutiem facile prætervisa.

F ·15 × ·08; *lob* ·08; *c* $\frac{1}{60}$; *f*^{la} ·07; *br* ·3; *br*^{la} ·25 × ·08; *per* ·4 × ·25–·3^{mm}.

Minuta rufa dense cæspitoso-procumbens. Caules 3^{mm} longi fragiles flexuosi pauciramei.

Folia distantia late patentia ovato-lanceolata subacuta, rarius obtusata, integerrima rariusve cellula una alterave extante subcrenulata, recte complicata; lobulus dimidium folium æquans superansve,

ovatus subinflatus acutus, sæpe nullus; cellulæ minutulæ suboblongæ subplanæ (ad plicam tamen convexulæ), medio pellucidæ, ambitu annulo chlorophylli lato colorato opacæ. F. ramulina interdum diminuta subæquiloba.

Foliola minuta bipartita, cruribus 4 cellulas longis, basi 2 cell., apice 1 cell. latis.

Flores monoici: ♀ in ramo perbrevi terminales, innovatione simplice suffulti. Bracteæ foliis duplo longiores appressæ, ad medium complicato-bilobæ, lobis lanceolatis acutis, inferiore subbreviore duplo angustiore; bracteola lanceolato-oblonga vix ad $\frac{1}{2}$ bifida, segmentis erectis subobtusis acutisve.

Perianthia foliis triplo fere longiora, obovata vel turgide pyriformia brevirostria 5-carinata, carinis superne cellulis pellucidis exstantibus plus minus papulosis.

Androœcia in ramis terminalia; bracteæ paucæ, 2 vel 3, majusculæ rotundo-cymbiformes, apice bilobæ.

L. lepida L. et G. Syn. Hep. 766; Gottsch. in Hep. Mex. 224, nostræ foliorum forma lobuloque vario sat similis, foliola habet majora ad $\frac{1}{2}$ solum bifida; bracteas subæquilobas; bracteolam magnam ovato-rotundam, et perianthium lævissimum.—*L. cancellata* Mont., foliis ovalibus obtusis grosse reticulatis, perianthiis cylindricis apice solo pentagonis, longius distat.

7. MICRO-LEJEUNEA PUSILLA, Spruce.

Hab. Chimborazo, in arboris folio vivo, cum aliis hepaticis.

F ·35 × ·3 (*lobulo incluso*) *vel* × ·2 (*lobulo excluso*); *lob* ·15; *c* $\frac{1}{30}$; f^{la} ·075 × ·1; *br* ·35; br^{la} ·3 × ·1; *per* ·6 × ·3^{mm}.

Pusilla albicans pellucida. Caules 1^{cm} longi prostrati vage subpinnatim ramosi, ramulis subinde parvifoliis.

Folia subcontigua, angulo 50°–60° patula, oblique ovato-ovalia rotundata obtusatave caviuscula, infra medium valde sinuato-complicata; lobulus plus duplo brevior ovatus turgidus, apice brevi acuto; cellulæ parvæ pellucidæ.

Foliola minuta, foliis 5-plo fere minora, caule vix latiora, cuneato-rotunda, apice vix ad $\frac{1}{2}$ bifida, segmentis obtusis patulis basi 4 cellulas latis.

Flores monoici: ♀ in ramo brevi terminales, innovatione tenui suffulti. Bracteæ appressæ foliis subæquilongæ, profunde bilobæ, lobis subinæqualibus lanceolatis obtusis acutisve; bracteola cuneato-lanceolata ad $\frac{1}{3}$ bifida.

Perianthia alte emersa pellucida pyriformia rostellata subcompressa præalte 5-carinata, apice demum in valvulas 5 apiculatas dehiscentia.

Amenta ♂ cauligena, folio collaterali sublongiora; bracteæ sub 3-jugæ.

Lejeuneæ cucullatæ N., *L. lucenti* Tayl., et *L. perpusillæ* Spruce affinis, ab illis omnibus florescentia monoica distat.—Ad *Harpa-Lejeuneas* e foliolis subcuneatis, segmentis breviusculis obtusis, accedit.

SUBGENUS XXXV.—*COLO-LEJEUNEA*, S.

Subgenus, defectu foliolorum bracteolarumque absoluto, a cæteris

omnibus Lejeuneis diversum, quoad foliorum formam sat variabile, in duas sectiones naturales (fere subgenericas) perianthii forma bene dividendum: sc.

I. PHYSOCOLEA, *perianthiis turgidis argute 5-carinatis, rarissime fere ecarinatis.*

II. LEPTOCOLEA, *perianthiis valde compressis, sæpe obcordatis, postice convexis carinisque 2 (demum subobsoletis) percursis.*

Physocoleæ caracteres pleniores sunt qui sequuntur.

Plantæ pusillæ, aliæ præminutæ, prostratæ, plagulas tenues—vix unquam stratificatas—sistentes, raro ramis assurgentibus cæspitulosæ. Caules fragiles subfasciculatim, raro pinnatim, ramosi, ramique geniculato-flexuosi, folium ad quemque flexuram proferentes.

Folia sæpius dissita, basi perbrevi fere transversa inserta, subrotunda ovaliave, v. margine postico fere toto incurva turgidaque, v. solum concava, cochleariformia, lobulo dimidium folium fere sistente v. ad dentem redacto; raro angustiora acuminataque, lævia papulosave, rarissime muriculata; cellulæ parvæ (mediæ $\frac{1}{40}$—$\frac{1}{64}$ mm. diametro), fere semper leptodermes planæ v. obtuse (raro acute) prominulæ.

Foliola nulla. Radicellæ sæpe cuique folio tributæ, paucæ, fasciatæ penicillatæve.

Flores monoici, rarissime dioici. Rami ♀ innovati; bracteæ foliis vix diversæ, inter se et a perianthio sæpius dissitæ, raro complicatæ, parvi-lobulatæ vel non; bracteola 0.

Perianthia turbinata, raro longe pyriformia, turgida, alte 5-carinata (in unica sp. fere ecarinata) carinis sæpius papulosis, raro muricatis, post capsulam emissam elongata et quasi-stipitata.

Androecia varie posita; bracteæ sæpe magnæ, pauci-multijugæ, monandræ.

Leptocolea a *Physocolea* differt perianthii forma, necnon colore sæpe rufescente, foliis planioribus oblongis sublinguæformibus, lobulo normali parvo interdum fere obsoleto; bracteis multo minoribus complicatis, altera (minore) sæpe fere æquiloba.

Hab. Species Americæ tropicæ plurimæ foliicolæ filicicolæque, paucæ in arborum truncis ramulisque, præcipue sæpius inundatis; Europææ in arborum fruticumque (*Quercus, Ulicis, Callunæ*, etc.) cortice, etiam ad rupes, in *Frullaniis* persæpe parasitantes.

Distr. In America æquatoriali 11 species legi, quarum 7 (omnes novæ?) ad § *Physocoleam* pertinent—una per totam continentis latitudinem, ab oris atlanticis ad pacificas usque, obvia, etiam in Andes sylvaticos ad alt. 2000^{m} usque ascendit; cæteræ omnes extra planitiem Amazonicam haud visæ. Ad § *Leptocoleam* referendæ sunt species 4, quarum 2 antea indescriptæ, omnes planitiicolæ nisi C. *L. micrandræcia* n. sp. in Andibus Peruvianis alt. 500^{m} semel inventa.—Aliæ *Colo-Lejeuneæ* ab auctoribus descriptæ sunt 10 (vel plures) species, sc. 3: *L. minutissima* Sm. (= *L. inconspicua* Raddi), *L. calcarea* Lib., et *L. microscopica* Tayl., insulis Britannicis (Hibernia præcipue), 2 priores etiam in Europa continentali et America bor. temperata, indigenæ; 4 vel 5 Americæ tropicæ adscriptæ et 3 palæotropicæ, quæ omnes iterata examinatione egent.

I. PHYSOCOLEA.

1. *Folia basi postica lobulo tertio (stylove) minuto digitiformi aucta.*

[*C. L. calcarea* Lib. F. concinne disticha, facie muriculata, margine muri-

culata denticulataque, recte laxe complicata, lobo ovato acuminato acuto, apice decurvulo, lobulo normali duplo breviore angustioreque subquadrato plano. Rami ♀ brevissimi, innovatione simplice microphylla aucti. Br. foliis submajores quadrato-rotundæ bilobæ, vix complicatæ, valde muricatæ. Per. turbinata v. ovato-oblonga, rotundato-truncata obsolete rostellata obtuse 5-carinata tota facie muriculata. *Europa.*]

2. *Folia lobulo accessorio nullo.*

A. *Flores dioici.*

1. *C.-L. megalandra.* F. disticha sed varie patula flaccida subrotunda, integra, haud complicata, margine postico fere plana vel late incurva; cellulæ subprominulæ punctulatæ. Andrœcia in caule terminalia, robusta julacea; br. plurijugæ magnæ turgidæ, antheridium solitarium maximum foventes.

B. *Flores monoici.*

2. *C.-L. turbinifera.* Caules breves subfasciculato-ramosi. F. subimbricata obovata vel fere orbiculata retusa rotundatave, facie margineque papulosa minuteque scaberula, a basi alte complicata, plica lanceolata vix inflata. Fl. ♀ in caule ramisque terminales, innovatione (sæpe prolifera) suffulti. Br. dissitæ foliis fere conformes, raro complicatæ, interdum apice bilobæ. Per. turbinata turgida ab ipsa basi argute 5-carinata ubique papulosa. Andr. in ramo terminalia; br. 3–5-jugæ.
3. *C.-L. myriandrœcia.* Caules elongati, ramulis ♀, et præcipue ♂, crebre pinnulati. F. distantia elliptica rotundata obtusatave, margine postico fere toto (interdum bis) complicata sublævissima. Fl. ♀ in ramulo brevi innovato (interdum prolifero) terminales. Br. dissitæ eplicatæ infra apicem dente extante lobulatæ. Per. pyri-vel fusiformia acute 5-carinata lævia.
4. *C.-L. gymnocolea.* Caules basi fasciculatim ramosi. F. subimbricata sæpe subsquarrosa late semiovata obtusata, haud complicata margine autem postico supra medium unidentata. Fl. ♀ in caule ramove iteratim innovando-prolifero terminales. Br. distantes, foliis conformes. Per. basi nuda, pyriformia subcompressa acute 5-carinata lævissima.

[*C.-L. minutissima* Sm. Vage ramosa. F. distantia subrotunda tota fere longitudine complicata valde concava turgidaque subpapulosa, lobulo lobo perpaulo angustiore. Br. ♀ foliis duplo longiores late oblongæ parum complicatæ, brevissime bilobæ, lobulo postico duplo angustiore. Per. emersa turbinata pyriformiave compressula argute 5-carinata sublævia, interdum ad carinas cellulis pellucidis uniseriatis papulosa. Andr. ramis brevibus robustis constantia; bracteæ foliis subminores majoresve cymbiformes valde papulosæ monandræ. *Europa.*]

[*C.-L. microscopica* Tayl. Præminuta albida pellucida subramosa. F. distantia ovoideo-fusiformia alte papulosa parum inæquiloba, lobo antico ultra posticum in apicem brevem subacutum, triangularem v. brevilinguæformem sæpe prominente. Br. parum dissitæ foliis angustiores longioresque. Per. obovata obconicave ecarinata pellucida. Fl. paroici. *Hibernia.*]

5. *C.-L. liliputiana.* Minuta. F. distantia ovato-ligulata triplo longiora quam lata, a basi ad $\frac{2}{3}$ alt. tota convoluto-complicata, ultra plicam

in apicem planum obtusatum producta. Br. foliis longiores ligulatæ ad $\frac{1}{3}$ bifidæ subæquilobæ. Per. pyriformia 5-carinata, carinis apice rotundo-subprominulis.

6. *C.-L. ensifolia.* Minuta albida pellucida. F. dissita falcata et hamata, anguste lanceolata acuminata 5–7-plo longiora quam lata, recte complicata, lobulo inflato f. 4-plo breviore (nullove). Fl. in ramo brevissimo terminales, innovatione interdum prolifera suffulti. Br. foliis subconformes, lobulo autem longiore. Per. subemersa obconico-pyriformia supra medium 5-gona, angulis superne papulosis.—Var. *pygmæa*, præminuta, foliis subplanis latioribus, ovato-lanceolatis; perianthii carinis apice rotundo-prominulis.

II. LEPTOCOLEA. *Per valde compressa, sæpe obcordata, postice convexa carinisque* 2 (*demum subobsoletis*) *percursa.*

A. *F. cellulis marginalibus subconformibus.*

7. *C.-L. micrandræcia.* Pallide viridis. F. contigua oblonga rotundata, ipsa basi complicata, plicâ minutâ margine dente setiformi auctâ, subpapulosa. Br. minutæ. Per. obcordato-cuneata margine papulosa cæterum lævia. Andr. ramulo minuto tenui cauligeno constantia.

8. *C.-L. obliqua.* Albicans. F. subdissita sæpe assurgenti-secunda oblique oblonga v. subligulata rotundata, margine facieque (apicem versus) scaberula; lobulus 2–4-plo brevior ovato-rectangularis, basi sola turgidus, apice bidentatus. Br. parvæ complicatæ. Per. cuneata truncata obcordatave tota facie muricata. Andr. in ramis terminalia laxiuscula.

9. *C.-L. platyneura.* Rufula. F. subimbricata ovato-linguæformia rotundata antice celluloso-erosula, cellulis mediis pluriseriatis elongatis vacuis late vittata, cæteris cellulis minutissimis muricato-prominulis; lobulus 3-plo brevior subtransversus ovato-fusiformis acutus. Br. f. breviores, altera (major) inæquiloba, altera fere æquiloba. Per. late cuneata rotundo-truncata, margine toto minute muriculata. Andr. spica brevi cauligena constantia.

B. *Folia margine, v. saltem apice, cellulis elongatis vacuis scarioso-limbata.*

10. *C.-L. subscariosa.* Rufescens tenerrima. F. imbricata semicordato-oblongo-rotunda apice scariosa, lobulo minuto sæpe obsoleto. Rami ♀ brevissimi innovati, interdum biflori. Br. foliis multo minores. Per. late obcordato-cuneata postice gibboso-convexa ecarinata, margine peranguste alata. Andr. brevia, v. ramulo constantia v. in caule terminalia.

11. *C. L. cardiocarpa.* Viridi-rufa. F. imbricata ovato-oblonga obtusata, cellulis autem adventitiis scariosis sæpissime acuminata; lobulus 2–3-plo minor planus sublingulatus obtusus. Br. foliis fere æquimagnæ. Per. late obovato-pyriformia rotundata v. obcordata, postice alte convexa primum 2-carinulata. Andr. cauligena folio proximo sublongiora.

1. COLO-LEJEUNEA MEGALANDRA, Spruce.

Hab. In flum. Amazonum sylvis, juxta *Obidos*, in cortice vetusto.

F. ·4 × ·35, ·35 × ·25, *c* $\frac{1}{40}$mm.

Minuta, saturate viridis, dense late cæspitosa. Caules 2–3mm longi ascen-

dentes pellucidi, 3 cellulas diametro, simplices vel ramum unum alterumve edentes—rarissime longiores et subpinnati.

Folia dissita vel subimbricata, basi brevi subtransversa distiche inserta, varie patula, flaccida et undulata, subrotunda concava repanda papulosa, margine postico planiuscula vel plus minus late incurva, lobulo nullo; cellulæ parvulæ æquilatero-hexagonæ leptodermes convexulæ, tota facie verruculosæ (quasi punctulatæ) opacæ, demum pellucentes.

Foliola nulla. E cujusque folii basi profertur radicella una alterave prælonga—raro plures fasciculatæ.

Flores dioici: ♀ haud visi; andrœcia magna ovato-fusiformia, caulis dimidium superiorem tenentia; bracteæ plurijugæ, arctiuscule imbricatæ, inferiores foliis imo majores, superiores sensim minores, turgidæ, margine postico toto late involuto antheridium solitarium maximum foventes.

Forsan pro forma *L. turbiniferæ* juvenili, mere mascula, habenda; florescentia attamen dioica cum eadem conjungere vetat.

2. COLO-LEJEUNEA TURBINIFERA, Spruce.

Hab. In arborum pomiferarum cortice in Andibus Quitensibus infra 2000m. alt., locis *Baños*, ad pedem M. *Tunguragua*, in *Citri* cortice, *Loja* et *Guataxi;* etiam ad Andium pedem occidentalem, loco *Daule* prope *Guayaquil;* ad fl. Amazonum ostia juxta prædium *Tauaũ;* ad *S. Carlos* fl. *Negro*, in *Artocarpi* cortice.

F ·4×·35; *lob* ·1 *latus; c* $\frac{1}{4}\frac{1}{5}$; *br* ·45×·35; *per* ·5×·35, ·65×·45mm.

Pusilla tenera viridis in plagulas densas effusa. Caules $\frac{1}{8}$–$\frac{1}{2}$ pollicis longi fragiles pellucidi, subfasciculato-ramosi, ramique paucifolii arcte repentes subassurgentesve, ad foliorum insertionem geniculati.

Folia plus minus imbricata, assurgentia, ex angusta et subtransversa basi obovata, cuneato-rotunda v. fere orbiculata, apice lato retusa rotundatave, facie margineque papulosa, a basi ad medium vel fere ad apicem usque complicata, plica erecta lanceolata parum inflata sæpius edentula; cellulæ subparvæ æquilateræ leptodermes, insigniter convexo-prominulæ, scaberulæ, subpellucidæ, chlorophyllo parco et v. sparso v. in cellulæ centro congesto.—In ramis sterilibus frequenter adveniunt folia solum concava, margine postico gibboso-incurva, nec complicata.

Foliola 0, adsunt tamen radicellæ validæ, solitariæ v. paucæ et fasciatæ, ad folii cujusque basin.

Flores monoici et dioici: ♀ crebri, terminales, innovatione parvifolia brevi simplice, v. longiore iterumque florifera, suffulti. Bracteæ (vix propriæ) alternæ, inter se et demum a perianthio late dissitæ, foliis fere conformes, snborbiculatæ, raro subcomplicatæ, v. apice inæqualiter bilobæ v. lobulo angusto explanato auctæ; bracteola 0.

Perianthia subemersa—demum alte exserta—turbinata, turgida tenuirostellata, ab ipsa basi argute 5-carinata, ubique, ad carinas præcipue, papulosa.

Andrœcia ramum terminantia validiuscula, ovoidea compressula; bracteæ 3–5 jugæ, haud arcte imbricatæ, foliis minores sed latius complicatæ, monandræ.

L. epiphyta G. (Syn. Hep. 391.) differt foliis ellipticis (explanatis cordatis), perianthiis parvis apice solo pentagonis.

Obs. In the fold of the leaves I find sometimes as many as ten globular pale reddish bodies (eggs?), with a perfectly smooth thin coat or shell, containing only mucus.

3. COLO-LEJEUNEA MYRIANDRŒCIA, Spruce.

Hab. Ad fluvium *Uaupés*, in imis truncis inundatis arenaque obrutis.

F ·3 × ·2, *lob* ·25, *c* $\frac{1}{64}$; *br* ·3 × ·15; *per* ·35 × ·15; *andrœcia* ·25–·5^{mm}.

Pusilla pallide olivacea tenui strato late effusa. Caules filiformes $\frac{1}{4}$–$\frac{1}{2}$ poll. longi, parum divisi, dein ramulis crebris brevibus—sæpe floriferis, ♀ vel ♂—pinnulati.

Folia distantia, basi angusta transversa inserta, angulo 45° patentia, elliptica rotundata obtusatave integerrima concava, margine toto fere postico obtuse complicata; lobulus (potius plica) cætero folio duplo et ultra angustior, lanceolatus, sæpe iterum implicatus; cellulæ minutulæ æquilateræ vel parum elongatæ, subplanæ, leptodermes, opacæ, chlorophyllo sat copioso cellulæ centrum versus coacervato.

Foliola 0. Radicellæ pallidæ inæquilongæ, paucæ ad cujusque folii basin fasciculatæ.

Flores monoici: ♀ in ramulo brevi parvifolio, innovando sæpeque iterum florifero, terminales. Bracteæ foliis caulinis æquilongæ sed angustiores, ovales, paulo infra apicem dente extante (lobulum sistente) auctæ, vel non; altera sæpe minor; bracteola 0.

Perianthia parum emergentia pyriformia vel subfusiformia, brevissime rostellata, tota longitudine alte 5-carinata.

Andrœcia floribus ♀ longe numerosiora, ramulo brevi constantia; bracteæ 3–8-jugæ cymbiformes, apice rotundato brevissime bilobæ.

A *Colo-L. turbinifera* S. differt caule elongato crebre pinnulato; foliis et præcipue bracteis angustioribus; perianthiis plus duplo longioribus quam latis—pyriformibus, nec turbinatis; demum cellulis dimidio minoribus subplanis.

Obs. There is no proper lobule, but the postical margin of the leaf is widely folded in, the fold being widest in the middle, and running to a point at each extremity, so as to be somewhat lanceolate. Sometimes the fold itself is again enfolded, along its middle, so that the leaves may be called "bis complicata."

4. COLO-LEJEUNEA GYMNOCOLEA, Spruce.

Hab. In *Calliandri surinamensis* ramulis, aquis fluvii Bombonasa inundatis.

F ·8 × ·625, ·65 × ·55, *c* $\frac{1}{50}$; *per* ·75 × ·45^{mm}.

Pusilla cæspitosa viridis. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicares, ascendentes, basi dense radicellosi fasciculatim ramosi; rami arhizi, 3 cellulas lati, pellucidi, simplices vel ramulosi.

Folia imbricata vel dissita, distiche patula vel subsquarrosa, basi angusta inserta, late semiovata obtusata, undulata, siccando crispata, margine postico supra medium unidentata (dente lobulum sistente, interdum nullo); cellulæ parvæ æquilateræ conformes leptodermes valde chlorophyllosæ.—Ad surculos elongatos aliquando adveniunt folia apice triloba vel heteromorpha.

Flores monoici: ♀ terminales in caule ramove iteratim innovando—prolifero. Bracteæ propriæ nullæ, nisi folium perianthio proximum, innovationi ex parte adnatum, cæteris foliis paulo majus, pro bractea habendum.

Perianthia basi nuda (*i.e.* a bractea subremota) foliis caulinis subæquilonga, pyriformia subcompressa, tota longitudine acute 5-carinata, lævissima, apice rotundato obsolete rostellata. Capsula globosa, breviter exserta.

Andrœcia spicam elongatam—raro breviorem—in ramo primario pro more terminalem sistentia; bracteæ usque ad 20-jugæ julaceo-equitantes late ovatæ ventricoso-concavæ, apice brevissime inæqualiter bifidæ, lobis obtusis. Antheridia magna *solitaria*.

Plantula singularis et exquisita, *L. minutissimæ*, *turbiniferæ*, e. a. certe affinis, sed distinctissima!

5. Colo-Lejeunea liliputiana, Spruce.

Hab. Ad fluvium *Casiquiari*, in arborum foliis vivis, supra alias *Lejeuneas* repens.

F ·15 × ·05, *lob* ·1, *c* $\frac{1}{60}$; *br* ·2–·25 × ·07; *per* ·25 × ·15^{mm}.

Minuta pallida. Caules $\frac{1}{8}$-pollicares filiformes fragiles flexuoso-intricati, pauciramei, radicellosi.

Folia distantia ovato-ligulata, triplo longiora quam lata, a basi ad $\frac{2}{3}$ alt. tota latitudine convoluto-complicata—plica rarissime obsoleta—apice plano obtusata; cellulæ subconformes rhomboideo-hexagonæ parum elongatæ pellucidæ leptodermes. Foliola 0.

Flores monoici: ♀ terminales, cum innovatione. Bracteæ foliis dimidio longiores suberectæ ligulatæ, apice ad $\frac{1}{3}$ bifidæ, segmentis subæqualibus subacutis; bracteola 0.

Perianthia subemersa pellucida pyriformia brevirostria vix compressa 5-carinata, carinis apice rotundo-subprominulis.

A *L. ensifolia* distat minutie, foliis latioribus multo magis alte complicatis, bracteis subæquilobis, perianthii carinis lævibus.

6. Colo-Lejeunea ensifolia, Spruce.

Hab. Ad fl. *Negro*, plurimis locis, in filicibus, præcipue *Trichomanis* speciebus diversis, rarius in arborum foliis; ad *S Carlos*, in *Parivoæ* legumine carioso.

F ·5 × ·07, ·1; *lob* ·125–0; *c* $\frac{1}{36}$–$\frac{1}{24}$; *br lob* ·5 × ·1; *per* 6 × ·4^{mm}.

Minuta, in plagas albidas flavidasve conferta. Caules $\frac{1}{4}$-pollicares prostrati vage et subfasciculato-ramosi, ramis interdum a matrice liberis arcuatis apice sensim parvifoliis.

Folia dissita, assurgenti-secunda, falcata et hamata, anguste lanceolata acuminata, latitudine varia (4–10c. ubi latissima), sæpe 7-plo longiora quam lata, pellucida, cellulose-subcrenulata, recte complicata; lobulus 4-plo brevior inflatus, fusiformis, sæpe nullus; cellulæ mediocres, marginales subminores oblique rhombeæ, interiores oblongæ 4–6-angulares, folii axi parallelæ, omnes parum prominulæ, leptodermes.

Foliola nulla; haustoria interdum cuique folio tributa, penicilliformia, sæpe tamen absentia.

Flores monoici: ♀ in ramo brevissimo terminales, cum innovatione

perbrevi simplice—raro in ramo longiore innovato. Bracteæ foliis subconformes bilobæ (nec semper complicatæ) lobulo lobo duplo breviore lanceolato v. lineari; bracteola 0.

Perianthia foliis sublongiora obconico-pyriformia rotundato-truncata obscure rostellata supra medium 5-gona, angulis apice carinatis subpapulosis, demum aperta campaniformia.

Andrœcia in ramis terminalia; bracteæ sub 5-jugæ laxæ foliis parum diversæ, lobulo autem majore.

Var. *pygmæa*. Caules foliaque minora matrici arcte applanata. Folia ovato-lanceolata obtusa subacutave 10–12 cell. lata, lobulo triplo breviore nullove. Perianthia carinis apice altius rotundo-prominulis papulosis.—*Manâos*, in *Adianti* fronde; *S. Carlos*, in arboris folio. —Pro foliis planissimis latioribus, perianthiisque apice quasi 5-umbonatis, probabiliter species propria erit.

7. COLO-LEJEUNEA MICRANDRŒCIA, Spruce.

Hab. Tarapoto Andium Peruviæ in *Acrostichi* frondibus.

F ·8 × ·4, ·75 × ·5; *c* $\frac{1}{30}$; *br* ·25; *per* ·6 × ·4, ·5 × ·35^{mm}.

Pusilla prostrata arcte adhærens pallide viridis; Caules $\frac{1}{2}$-pollicares subramosi fragiles.

Folia pro plantula magna, contigua v. subimbricata, plana, oblonga v. ovato-oblonga—alia longiora angustioraque subligulata—apice rotundata truncatave, margine subcrenulata, basi brevissime inflexa, plica plana triangulari medium versus dentem setiformem cell. 3–5 longum erecto-patentem proferente; cellulæ mediocres oblongo-4–6-gonæ leptodermes pellucidæ convexulæ.

Foliola 0; haustoria quotquot folia, penicillata.

Flores monoici: ♀ in ramo brevissimo, innovatione parva simplice suffulti, terminales. Bracteæ minutæ, foliis 3-plo breviores, ligulatæ, lobulatæ, complicatæ (vel altera non); bracteola 0.

Perianthia obcordato-cuneata valde compressa, rostello perbrevi lato aucta, antice convexula apiceque obscure obtuse carinulata, postice humiliter bicarinata, carinis approximatis demum in unam latam confluentibus, margine papulosa.

Andrœcia cauligena minuta, folio proximo 3–4-plo breviora, bracteis 3–4 jugis turgidis.

Species pulchella distinctissima! *L. Dozyana* Lac. Hep. Jav. t. 12, affinis videretur.

8. COLO-LEJEUNEA OBLIQUA, Mont. et N.? Ann. Sc. Nat. a. 1843, p. 264.—*Lejeunea erigens*, Spruce Mst.

Hab. In sylvis fl. Amazonum et præcipue fluviorum *Negro*, *Uaupés* et *Casiquiari*, ad arborum folia viva; in Andes quoque sed rarius ascendit.

F ·85 × ·45; *lob* ·25; *c* $\frac{1}{3\cdot5}$; *br* ·35; *per* ·65 × ·35^{mm}.

Mediocris pallida albescens flavidave, arcte adrepens sæpeque alias Lejeuneas infestans. Caules pollicares in orbem radiatim sed laxe ramosi, ramis pro more paucis elongatis.

Folia flaccida pellucida, dissita, raro subimbricata, horizontalia vel sæpe (post siccationem præcipue) assurgenti-secunda, basi perangusta sub-

transversa inserta, oblique ovalia oblongave, interdum fere ligulata, sæpe subdimidiata, apice rotundata, facie, marginem anticum apicemque versus, necnon in ipso margine, scaberula, cæterum lævia integerrimaque, recte complicata; lobulus 2–4-plo brevior ovato-rectangularis basi turgidus; supra medium planus appressus, apice bidentatus; cellulæ mediocres, subleptodermes, inferiores sensim longiores, ad folii marginem anticum apicemque minores papilla brevi auctæ, cæteræ subplanæ.

Flores monoici: ♀ in ramo sæpe iteratim innovando terminales. Bracteæ foliis plus duplo breviores complicatæ, lobo ligulato obtuso, lobulo sat minore lanceolato acuto, altera bractea longe minore; bracteola nulla.

Perianthia emersa, f. caulinis breviora, cuneato-pyriformia compressa brevi-rostellata truncata v. obcordata, postice bicarinata (carinis demum in unam fere confluentibus) facie tota, ad margines complanatos carinasque præcipue, cellulis in papillam alte conicam acutam elevatis exasperata.

Andrœcia ramos tenuinantia laxiuscula; bracteæ 6–10-jugæ, inferiores distantes inæqualiter bilobæ, superiores sensim minores totæ fere complicatæ.

Var. *lævigata*. Duplo minor; foliis angustioribus (·45 × ·2^{mm}), lobulo inflato-fusiformi; bracteis longioribus, perianthii carinis angustioribus. —Ad fl. Amazonum et *Negro*, necnon in M. *Tunguragua* (alt. 2200^{m}).

Var. *elobulata*. Parvula, foliorum lobulo plane nullo.—Ad rivulum *Cauapuna* juxta Venezuelæ confinia borealia.

The radicles leave the stem, from the base of each leaf, in a short cylindrical fascicle, then spread out into a disciform haustorium, as in *Odonto-Lejeunea*.

In the inflated base of one leaf I found seven closely-packed small spherical muriculate bodies, probably eggs.

9. COLO-LEJEUNEA PLATYNEURA, Spruce.

Hab. S. Gabriel, juxta fluvii Negro cataractas, in arboris folio vivo.

F ·4 × ·3, *lob* ·125–·15 × ·1, *c. mediæ* $\frac{1}{40}$–$\frac{1}{30}$; *submarginales* $\frac{1}{100}$; *br* ·3 × ·1; *per* ·5 × ·4^{mm}.

Pusilla pulchella tenuis rufula arcte appressa; caules $\frac{1}{8}$–$\frac{1}{4}$-pollicares parum ramosi.

Folia subimbricata, angulo axiali sub 70° patentia, basi perbrevi affixa, oblique ovato-oblonga sublinguæformia, rotundata, margine antico minute celluloso-erosula, postico subrecte complicata; lobulus subhorizontalis, deorsum convexus, folio sub 3-plo brevior, ovato-fusiformis subinflatus, apice exciso-acutus; cellulæ inferiores mediæque multo majores subelongatæ vacuæ, *nervum latum simulantes*, subapicales et submarginales (plurium serierum juxta marginem anticum) minutissimæ guttulatæ muricato-subprominulæ.

Foliola 0, eorum loco ad cujusque folii basin adest haustorium.

Fl. monoici: ♀ in ramis brevissimis terminales, innovatione paucifolio suffulti; bracteæ foliis breviores, altera (innovationi adnata) ad medium bifida, lobo ligulato obtusato, lobulo rhomboideo subacuto lobo subæquilato sed breviore; altera bractea duplo minor fere æqualiter bifida; *bracteola* 0.

Perianthia emersa, foliis caulinis sublongiora, late cuneata rotundato-truncata vel subretusa, cum rostello perbrevi, compressa, antice convexula depressave, postice carinis 2 obtusis approximatis in unam latam demum confluentibus percursa, margine toto minute muriculata.

Amenta ♂ folio c. breviora longiorave, spicata; bracteæ 3–6-jugæ compresso-hemisphæricæ.

10. COLO-LEJEUNEA SUBSCARIOSA, Spruce.

Hab. S. Gabriel fl. *Negro*, in arboris folio.

F ·7 × 5, ·65 × ·5, *lob* ·12; *c* $\frac{1}{4}$–$\frac{1}{10}$; *br* ·25–·5; *per* ·6 × ·5^{mm}.

Pallide rufescens tenerrima, arcte adrepens. Caules $\frac{1}{2}$-pollicares subbipinnati, ramis brevibus.

Folia pro plantula magna imbricata plana v. leniter decurvula oblongo-rotunda, basi antica anguste semicordata caulem obtegentia, apice scarioso-marginata integerrima, basi postica recte complicata, lobulo minuto trapezoideo subobtuso sæpe obsoleto; cellulæ subpellucidæ, annulo opaco cinctæ, angulis perpaulo incrassatis vel non, mediæ parvulæ, basales sensim majores, folii margines autem versus multo minores, marginales ipsæ (apicales præcipue) deformatæ tenuissimæ elongatæ vacuæ.

Foliola 0, haustorio tamen cuique folio tributo.

Flores monoici; ♀ in ramo brevissimo terminales, innovatione perbrevi interdum iterum florifera stipati. Bracteæ foliis multo minores, inter se valde inæquimagnæ, complicato-bilobæ, altera lobis oblongis lanceolatisve pro more obtusatis, inferiore sat minore, altera bractea autem minor fere æquiloba.

Perianthia f. caulina vix æquantia, late obcordato-cuneata, valde compressa, apice emarginato brevi-umbonata, margine sublævissimo ala angusta raro aucto, facie antica subplana, postica gibboso-convexa sine ulla carina distincta. Capsula majuscula elliptico-globosa.

Andrœcia parvo ramulo constantia—raro in ipso caule terminalia; bracteæ sub 3-jugæ parvæ laxæ turgide ovoideæ.

L. cardiocarpa Mont. certe differt foliis ovatis grandilobulatis; bracteis majoribus f. caulinis fere conformibus. *L. platyneura* S. foliis fere duplo minoribus inmarginatis erosulis falsinerviis; perianthiis haud obcordatis, postice bicarinatis, margine muriculatis.

11. COLO-LEJEUNEA CARDIOCARPA, Mont.

In Ram. de la Sagra, Cuba, etc.: Botanique, p. 476, t. 18, f. 4. Syn. Hep. p. 394.

Hab. S. Carlos et *S. Gabriel del Rio Negro*, in arborum foliis vivis. Primum in insula *Cuba* inventa, nuperius a cl. LIEBMANN in *Mexico*.

F ·65 × ·4, *lob* ·2–·3, *c* $\frac{1}{10}$; *br* ·4–·6; *per* ·55 × ·45^{mm}.

Pusilla prostrata, e pallide viridi rufula. Caules breves, $\frac{1}{4}$ poll. longi, subramosi, ramis sæpe confertis inæquilongis.

Folia imbricata subplana ovato-oblonga obtusata, apice plerumque cellulis adventitiis elongatis scariosis vacuis 2–3-seriatis in acumen acutum protracta, ab apice ad $\frac{3}{4}$ long., vel ultra, biloba, complicata; lobulus planus, lobo 2–3-plo minor, sublinguæformis obtusus, axi

cauli fere parallelus; cellulæ parvulæ, apicalibus deformatis exceptis, subconformes, acute hexagonæ paulo elongatæ leptodermes, ambitu interno auguste opacæ.

Foliola nulla nisi patella radicellifera ad cujusque folii basin.

Flores monoici: ♀ in ramo iteratim innovando terminales. Bracteæ foliis paulo breviores, lobulo parum latiore, cæterum conformes; bracteola 0.

Perianthia vix emersa late obovato-pyriformia valde compressa, rotundato-truncata-retusulave — interdum obcordata—cum rostello perbrevi, antice convexula, postice primitus obtuse bicarinata, carinis approximatis, demum solum alte convexa ventricosave, lævia.

Amenta ♂ folio caulino sublongiora julacea; bracteæ 4–6-jugæ majusculæ scariosæ.

Anne revera planta Montagnei, cui tributa sunt folia lobulo minore, angusto vel rotundato, et *bracteolam semper præsentem* (Syn. Hep. l.c.)! —Montagneus ipse autem dicit "amphigastrium [involucrale] nullum reperi."

SUBGENUS XXXVI.—*DIPLASIO-LEJEUNEA*, S.

Plantæ pusillæ pallide rufæ, strato tenui arcte repentes. Caules $\frac{1}{4}$–$\frac{1}{2}$-pollicares fragiles parum ramosi.

Folia magna tenuia subcontigua basi perangustâ inserta, oblongo-rotunda, apice lato plana (nec convoluta) infra medium (interdum bis) complicata; plica lanceolata subinflata margine (apice) vel bidentata vel in dentem subulatum protracta; cellulæ parvulæ vel fere minutæ, subplanæ, pariete vel subtenui vel ad angulos mediaque latera incrassato.

Foliola duplicata (*i.e.* cuique folio tributa) foliis 2–4-plo breviora, late cuneata bifida-partitave, segmentis angustis acutis pro more divergentibus, radicellas fasciatas prodentia.

Flores monoici vel dioici: ♀ in ramo brevi longioreve terminales, innovatione simplice proliferave suffulti. Bracteæ parvæ complicatæ subæquilobæ; bracteola bifida (raro solum retusa) segmentis erectis.

Perianthia oblonga parum compressa brevirostria prælte 5-carinata lævissima.

Androecia plerumque ramulo parvo constantia; bracteæ 2–8-jugæ parvæ.

Hab. In arborum foliis vivis et in filicibus, persæpe aliis hepaticis (præcipue *Frullaniis*) irrepens. Altera species Austro-americana supra planitiem parum ascendit, altera regioni Andium sylvaticæ mediæ propria est.

Distr. Species sub 7 cognovimus, terris tropicis austrinisque indigenæ, quarum 5 Americanæ, ab Antillis ad Brasiliam et Peruviam usque dispersæ, 1 Africana (*L. Kraussiana* Ldnbg.) et 1 Tasmanica (*L. lyratifolia* H. f. et T.).

1. *D.-L. pellucida.* Dioica. F. basi simpliciter plicata, plica longe unidentata. Foliola bipartita, laciniis lanceolatis late divergentibus. Bracteola ♀ foliolis subconformis, laciniis autem erectis. Per. oblonga.

2. *D.-L. replicata.* Monoica. F. basi bis implicata, plica apice bidentula. Foliola cuneata ad $\frac{1}{4}$–$\frac{1}{2}$ bifida, laciniis patulis, superiora majora subquadrata. Bracteola anguste oblonga ad $\frac{1}{4}$ bifida. Per. magna fusiformi-oblonga duplo longiora quam lata.

1. DIPLASIO-LEJEUNEA PELLUCIDA (Meissn.).

Jung. pellucida Meissn. in Spreng. Cur. post. in S. Veg. 325.—Syn. Hep. 393.

Hab. In sylva Amazonica, ad arborum palmarumque folia, haud infrequens, præcipue secus fl. *Negro* ripas; in Andibus vix supra 1000m. ascendit (M. *Campana*, *Guayrapurina*, &c.), in filicum frondibus et Frullaniis repens.—Hic illic per Americam tropicam dispersa.

F ·9 × ·75, ·8 × ·65; *lob* ·3–·4; *c* $\frac{1}{6}$–$\frac{1}{0}$; *f*^{ta} ·3; *br* ·35; *per* ·6 × ·4^{mm}.

Tenuissima, hyalina, pallide viridis rufescensve, arcte adrepens. Caules $\frac{1}{2}$-pollicares, pârum ramosi, ramique ramulis ♀ sæpe crebre pinnulati, flexuosi, fragiles.

Folia magna, contigua v. subimbricata, tenerrima, apice sæpe scariosa, patentia, subplana convexulave, oblique obovato-vel oblongo-rotunda, basi ipsa angusta fere transversa, antice anguste semicordata, recte vel subsinuato-complicata, plica folio fere ter breviore ovali-lanceolata subplana v. gibboso-subinflata, margine medium versus in dentem majusculum subulatum (lobulum verum) protracta; cellulæ subpellucidæ, ambitu anguste subopacæ, leptodermes, v. æqualiter subincrassatæ, mediæ minutulæ æquilateræ, submarginales minutissimæ, subbasales breviores elongatæ, omnes subplanæ.

Foliola duplicata, foliis 3-plo breviora, bipartita, laciniis late divergentibus v. divaricatis, anguste ovato-lanceolatis, acutis, interdum subacuminatis, aliis angustioribus fere subulatis, margine repandis.

Flores dioici: ♀ in ramulo brevissimo terminales, innovatione pauci- (sæpe parvi-) folia suffulti, rarius in ramo longiore iteratim innovato pseudo-laterales. Bracteæ foliis fere 3-plo breviores, complicato-bilobæ, lobis ligulato-rhomboideis, postico paulo angustiore subacuminato; bracteolæ laciniæ lanceolato-ligulatæ erecto-contiguæ.

Perianthia f. caulinis subbreviora—raro sublongiora—oblonga, parum compressa, apice rotundato-truncata obsolete rostellata, argute 5-carinata, rufa lævissima. Calyptra tenuis subsessilis. Capsula breviter exserta.

Andrœcia lateralia minuta; bracteæ 2–3-jugæ.

In M. *Campana* adveniunt formæ duæ, 1. foliorum plica perangusta, interdum ad solum dentem redacta; 2. foliis bullato-concavis margine postico fere toto involuto.

L. unidentata L. et L!; Mont. Hist. &c. de Cuba, t. 19, f. 2; S. H. 392: parum diversa est foliolis brevius bifidis, segmentis subobtusis. Specimina in hb. Hook., ex ins. S. Vincentis, ab ipsis auctoribus nominata, foliorum lobulos habent apice exciso-*bidentatos*, altero dente sat breviore. —Pro *L. pellucidæ* varietate habenda.

2. DIPLASIO-LEJEUNEA REPLICATA, Spruce.

Hab. Andes Quitenses, in sylvis, supra alias Hepaticas repens, alt. 1500–3000m., locis fl. *Pastasa* infra *Baños*, *Guayrapata*, *Azuay*, &c.: rara.

F ·8×·65; *lob* ·4; *c* $\frac{1}{10}$; f^{la} ·25×·2, ·45×·4; *br* ·65; br^{la} ·6×·3; *per* 1·05×·5mm.

Tenella, pallide viridis rufulave, prostrata. Caules fragiles $\frac{1}{4}$–$\frac{1}{2}$-pollicares subramosi.

Folia dissita v. subimbricata; pro plantula magna, angulo axiali a caule patente, subconcava, a basi angustâ subtransversâ oblique suborbiculata, dimidio inferiore bis complicata; plicâ (duplice) lanceolata-fusiformi, utrinque acuta, margine abscondito, arte tamen explicato apice exciso-bidentula; cellulæ parvulæ æquilateræ subconformes pellucidæ parum chlorophyllosæ, pulchre incrassatæ, trigonis 8–12 in cujusque cellulæ ambitu valde conspicuis, fere planæ vel convexulæ.

Foliola duplicata, increscentia, folio 4–2-plo breviora, subimbricata, cuneata v. cuneato-obovata—superiora majora subquadrata—basi rotundata, apice ad $\frac{1}{4}$–$\frac{1}{2}$ bifida, sinu late triangulari, segmentis patulis anguste triangularibus subacutis, fascia radicellarum medio dorso gerentia.

Flores monoici: ♀ in caule ramove, sæpe iteratim innovando-prolifero, terminales, erecti. Bracteæ foliis breviores, vix ad $\frac{1}{2}$ usque complicato-bilobæ, lobis subæqualibus lineari-oblongis obtusis retusulisve; bracteola anguste oblonga ad $\frac{1}{4}$ bifida, laciniis acutis conniventibus.

Perianthia foliis longiora fusiformi-oblonga subcompressa prælte 5-carinata (carinis alæformibus), apice subrotundato tubulo perbrevi amplo aucta, lævissima. Calyptra perpaulo brevior duplo angustior anguste ovali-fusiformis. Capsula globosa.

Amenta ♂ ramulo, folio caulino sublongiore constantia—raro in ramo terminalia—ovato-linearia; bracteæ 6–8-jugæ, foliis sat minores, equitantes, cymbiformes, lobo obtuso, lobulo paulo minore acuto.

L. reflexiloba G. (Hep. Novo-Granat.); nostræ ob folia margine bis introflexa sat similis, distincta est foliolis ovato-lanceolatis et bracteola apice integro rotundata retusave.

The leaf is folded in at the postical margin, from the base to the middle, and the fold again folded in along its axis. Within the inner fold I often find one or two small globular reddish grains, without any apparent appendages. They are either eggs or the corpses of a Rotifer, like *Philodina rosea*.

SUBGENUS XXXVII.—*COLURO-LEJEUNEA*.

(*Colura* Dumort.)

Cum *Diplasio-Lejeunea* convenit foliolis duplicatis, differt foliis lobo inferiore (nec superiore) majore, apice elongato in clavam cornuve convoluto, marginibus superne v. liberis v. connatis ideoque sacculum verum efformantibus. Cellulæ mediocres leptodermes subpellucidæ convexæ planæve.

Foliola sæpius divergenti-biloba (ac in *Diplasio-Lejeunea*), raro solum apice bidentata basi autem sagittato-biauriculata.

Bracteæ ♀ minutæ integræ sæpius retusæ.

Perianthia campaniformia, apice convexo primum clausa, demum hiantia, superne 5-carinata, carinis apice in cornua brevia conica subhorizontalia dilatatis.

Andrœcia spiculis parvis cauligenis compresso-globosis constantia; bracteæ paucijugæ diandræ.

Hab. Species Americanæ in arborum foliis vivis, extra planitiem haud ascendentes; Europæa (unica) in cortice, raro ad rupes.

Distr. E speciebus 5 nobis cognitis una (*L. calyptrifolia* Hook.), insulas Britannicas habitat; 3 (*L. tortifolia* Mont., *L. sagittistipula* Spruce, et *L. ceratophora* N.) Americam australem; 1 (*L. corynephora* N.) insulam Manila.

A. *Foliorum rostrum tubulare* (*marginibus consolidatis*).

[*C.-L. calyptrifolia*, Hook. F. rostro corniformi acuto. Foliola parva bipartita, laciniis patulis lineari-subulatis. *Europa.*]

1. *C.-L. sagittistipula.* F. rostro clavæformi obtusato. Foliola ½ folio longiora ovato-rotunda apice bidentula, basi externa in auriculam bilaciniatam deorsum producta.

B. *Foliorum rostrum incomplete clausum* (*marginibus liberis imbricatis*).

2. *C.-L. tortifolia.* F. ovato-lanceolata supra medium convoluta (bis complicata). Foliola foliis 3-plo minora bipartita, laciniis subulatis divaricatis.

1. COLURO-LEJEUNEA SAGITTISTIPULA, Spruce.

Hab. San Carlos del Rio Negro, in folio vivo.

F ·8 × ·4 (*haud explanata*); *f^la* ·5 × ·375, *dent. apic.* ·07 (3–4*c. longi*), *d. basales* ·1–·125; *c* $\frac{1}{30}$^mm.

Pallida, mollis; [caulem unicum pollicarem incompletum, ramo solitario donatum, habui.]

Folia ascendenti-patula, lateraliter patentia nec imbricata (confertiuscula tamen) subrecurva, clavæformia, basi concavo-complicata; lobo superiore plus 2-plo minore suboblongo, sinu lato concavo in lobum inferiorem transeunte; inferiore a basi fere ad dimidium margine anguste involuto, deinde ad apicem usque in sacculum ovalem compressum margine clausum apice obtusatum, dimidium folium superum occupantem convoluto; cellulæ leptodermes subpellucidæ mediocres suboblongo-hexagonæ, utraque facie papuloso-prominulæ. Sectio sacculi apicalis 3-plo longior quam lata.

Foliola imbricata, dimidium folium excedentia, ovato-rotunda, apice bidentula, dentibus 3–4 cellulis longis apiculatis, *basi* exteriore deorsum sagittatim hastatimve producta, biloba, lobis subacutis, altero sæpe longiore folioli ¼ æquante. Radicellæ fasciatæ.

Planta maxime singularis perbella!

2. COLURO-LEJEUNEA TORTIFOLIA, Mont.

Ann. Sc. Nat. 1843, p. 265.

Hab. Ad folia viva in sylvis fl. *Negro*, *Uaupés* et *Pacimoni*. Guiana Gallica (Leprieur in hb. Mont.).

F 1·3 × ·4 (*explanata* ·6–·7 *lata*), *c* $\frac{1}{32}$; *f^la* (*crura*) ·3^mm.

Flavescens, robusta, flaccida tamen, prostrata; caules pollicares flexuosi parum ramosi intertexti.

Folia subdissita, sæpius assurgenti-secunda varie flexa tortaque, oblique ovato-lanceolata, margine postico toto anguste inflexo-complicata,

supra medium bis inflexa, (marginibus tamen liberis, nec ad *L. calyptrifoliæ* et *sagittistipulæ* instar agglutinatis) sicuti in tertio superiore subulam obtusam bi- (ex parte tri-) lamellatam sistentia; cellulæ subpellucidæ, limitibus latis subopacis, paulo elongatæ, læves.

Foliola ad quodque folium tributa bipartita, laciniis folio 3-plo brevioribus subulatis acutis basi 3 cell. latis divaricatis, disco radicellarum stipitato donata.

Flores dioici: ♀ in caule ramove iteratim innovando terminales; bracteæ foliis 2-plo breviores subplanæ oblongæ rotundatæ tenues; (bracteola nulla?)

III.* MYRIOCOLEA, Spruce, gen. nov.

(Sive *Lejeuneæ* subgenus 38.)

Genus novum, cum *Lejeunea*, et præcipue cum subgenere *Taxilejeunea* § *Codonocolea*, quoad structuram perianthii, capsulæ elaterumque conveniens, aliis caracteribus maximi momenti bene distinctum et proprium videtur. Differt enim præcipue foliis transversis, omnino elobulatis; bracteis floris paroici semper fere solitariis, oligandris (nec diandris), antheridia scilicet 4–7 in gremio foventibus.—Speciei unicæ adhuc cognitæ—plantulæ perbellæ et quam maxime singularis—descriptionem plenam adjicio.

1. MYRIOCOLEA IRRORATA, Spruce.

Hab. In Andium Quitensium radicibus orientalibus, alt. circiter 1000 metr., in sylva primæva "Canelos" dicta, ubi ad ramulos fruticulorum (*Cuphææ* sp., *Myrtacearum*, e. a.) aquis torrentis *Topo*, ad latera montium ignivomorum *Cotopaxi* et *Llanganati* oriundi, fluv. *Pastasa* defluentis, irroratos, sociis *Hypno loxensi* Hook. aliisque muscis hygrophilis, viget.

Caulis sectio ·6 × ·4, *c* $\frac{1}{30}$mm. *F* 3·0 × 2·4; *c. basales* $\frac{1}{24}$–$\frac{1}{20}$, *subapicales* $\frac{1}{60}$–$\frac{1}{50}$; *f*^{la} ·18 (*lata*), *crura* ·15 et ·2mm. *Per* 1·1 × ·4, ·9 × ·4, *c. mediæ* $\frac{1}{30}$; *calyptra* ·8–·9; *caps. valvulæ* ·4 × ·15; *elateres* ·2; *sporæ* $\frac{1}{10}$–$\frac{1}{8}$mm. *Antheridia* ·04, *stipes* ·08–·10mm.

Caudex perbrevis, sat crassus, compressus, radicellis copiosis albidis flexuosis matrici arcte adrepens, caules paucos fastigiatos, 2–4 centim. longos, omnino *arhizos*, pinnatim ramulosos edens. Caules virides, validi, tenaces, compresso-teretes, cellulis conformibus linearioblongis, sectione æquilatere hexagonis, conflati, dissite foliosi et extra cujusque folii basin (paucis inferioribus exceptis) juxta ejus angulum posticum, ramum brevem (1–2mm longum) proferentes. Rami inferne folia pauca (1–3) parva gerentes, dein decompositi, primum pinnati, ramuli autem brevissimi, cito in alios ramulos floriferos dissoluti, infra flores sæpe iteratim innovandi; sicuti flores, seriatim secundi et ad speciem laterales (revera cymulos uniparos sistentes) confertissimi, in capitulum 40–60-florem subglobosum, diametro 2–2$\frac{1}{2}$mm, evadunt.

Folia pallide viridia, caulina maxima, disticha, alterna, spatio 2 ad 2$\frac{1}{2}$mm dissita, basi transversâ semiamplexante utrinque brevissime decur-

rente inserta, obovata, inferne suberecta canaliculato-subcomplicata, supra medium recurvo-patula, late concava vel subexplanata et valde undulata, margine pulchre sinuato-crispa rarius hic illic incisula lobulatave, cæterum perfecte integra et integerrima, lobulo proprio omnino nullo. Ad caules steriles adveniunt folia confertiora, magis convolutiva, sese caulemque imbricantia. Folia caulina postice brevi spatio dissita, nunquam contigua imbricatave; antice autem folia proxima superiora margine auguste obtegunt, quare *incuba* dicenda, idem ac in cæteris Jubuleis. Folia ramea capitulorumque caulinis similia, nisi rotundiora, sæpe multoties minora; ad ramulorum insertionem tamen sæpe adstat folium majus, ad spathæ instar capituli partem involvens. Cellulæ inferiores majusculæ elongato-hexagonæ pellucidæ fere vacuæ; superiores submarginalesque sensim multo minores æquilateræ, chlorophyllosæ, apicales basalibus triplo breviores; omnes subplanæ—marginales vix parum convexulæ—pariete crassiusculo, trigonis nullis.

Foliola ad foliorum quodque par tributa, minuta, caule abscondita, foliis 15–20-plo minora, subquadrata, ad medium bifida, segmentis inæquilongis acutis; sæpe ad squamulam minutam triangularem redacta, vel etiam obsoleta.

Florescentia paroico-polygama, nempe flores in capituli ramis primariis terminales plerumque fœminei, cæteri omnes autem ad innovationes successivas terminales paroici. Bractea lateralis pro more unica, magnitudine valde varia, nunc folio caulino conformis, neque multo minor, perianthium alte superans; nunc multoties minor, ipso perianthio duplo brevior, oblongo-rotunda retusa, margine vix crispula; antheridia plerumque 4 (quorum una alterave interdum sterili) globosa, pallide flava, pedicello plus duplo longiore tenui (cellulis uniseriatis conflato) arcuato suffulta, in gremio fovens. Raro adveniunt bracteæ 2, altera brevior, antheridiifera tamen. Antheridia haud raro plura, inveni enim 7, omnia perfecta, in unicæ bracteæ axilla. In folii eandem bracteam proxime sequentis axilla aderant 6 antheridia abortiva, pedicello cellulis 2 vel 3 angustis, cellula magna globosa terminato constantia. Bractea postica (sive bracteola), bracteâ laterali saltem duplo minor, tenuis, cuneato-ligulata, apice valde inæqualiter bifida vel solum hinc angulato-unidentata, convoluta, pistillidium solitarium breviusculum amplectens. Bractea lateralis primum convoluta, bracteolam cum perianthio rudimentario pistillidioque involvens; tum, florescentiâ confectâ, plus minus patens. Sub flore mere fœmineo, cæteris floribus majore, axes floriferas terminante, nulla bractea antheridiifera adest.

Perianthia primum minuta, cordato-pyriformia, stylo pistillidii toto exserto, matura foliis caulinis subtriplo breviora, albida, clavato-prismatica, parum compressa, inferne obtuse 5-gona, apicem versus alte plicato-5-carinata, carinis apice oblique truncatis vel potius in cornua brevi-triangularia, arguta vel apice papilloso-2–3-denticulata, porrectis, rostello nullo, capsulâ emergente medio apice rupta; cellulæ mediocres elongato-hexagonæ, truncatæ, inferiores duplo longiores quam latæ. Calyptra paulo brevior, pyriformis, basi angustata quasi-stipitata, tenuis, cellulis unistratis laxis rhomboideis rectangularibusve conflata, demum apice irregulariter rupta. Capsula in pedicello nodoso-10-articulato pellucido exserta, oblongo-globosa, sporis repleta nigra, evacuata albida, vix ultra medium 4-valvis; valvulæ lanceolatæ, e stratis cellularum duobus tenuissimis pellucidis

subrectangulari-areolatis confectæ. Elateres sub 20 (16–24), $\frac{1}{5}$mm longi, 2 vel 3 utrique valvularum lateri subapicali adfixi, persistentes, lineari-tubulosi, apice dilatati, fibram planam linearem sinuosam sed non spiraliter tortam includentes. Sporæ magnæ, plus minus oblongo-globosæ, pressione mutua polyhædræ, asperulæ.

Obs. The habit of this plant is very peculiar, and unlike that of any other hepatic. From a short, prostrate caudex—adhering firmly by numerous long white radicles to twigs of small shrubs that grow on the rocky margin of the river Topo, a tributary of the Pastasa, and are perpetually moistened by the spray of its furiously-rushing waters—arise stout rootless stems, rarely much exceeding an inch in length, that are clad with large, distichous, transversely-inserted, obovate leaves, with crisped margins, entirely destitute of any trace of lobule, but accompanied by minute underleaves narrower than the stem and entirely concealed by it. From the base of each leaf (except a few of the lower leaves), and external to it springs a short branch, bearing a globose head of from 40 to 60 minute whitish perianths. Anything more alien from the aspect of a *Lejeunea* cannot well be imagined, and great was my astonishment, on examining the perianths and fruit, to find them almost exact counterparts of those of the subgenus *Taxilejeunea*. The inflorescence, however, is essentially different not only from that of every *Lejeunea* but from all other *Jubuleæ*, and it is only in the very young and still unrolled flowers that its nature can be accurately made out, for the male organs speedily fall away after fertilisation. A *solitary* convolute bract encloses not only several (4 to 7) antheridia but also the smaller postical bract (or bracteole), which in its turn involves the rudimentary perianth and its solitary pistillidium. The antheridia, by their globose form and slender arcuate stipes, recall the fruit of *Phascum* (*Sphærangium*) *triquetrum*; and in the unopened bracts they are in direct contact with the stigmatic orifice of the pistillidium: an arrangement which apparently ensures self-fertilisation. But the flower terminating each lateral axis of the capitulum is usually subtended by the bracteole alone, without any lateral bract or any trace of antheridia; yet it is always fertile and mostly larger than any of the other flowers.

P.S.—On page 81, an important character of *Stictolejeunea* has been inadvertently omitted. After the description of the leaves should follow: "Folia axillaria (ad ramorum originem) *cordata*—haud exacte æqualia, auriculâ autem posticâ paulo minore—neque solum semicordata, ac in cæteris foliis caulinis. Rami *intra* (nec extra) folii basin posticam inserti, quo caractere a cæteris omnibus *Lejeuneis* discrepat et ad *Jubulam* proprius accedit. Folium axillare tamen pro more rami basin solum obvelat, rarius eodem leniter insidet."

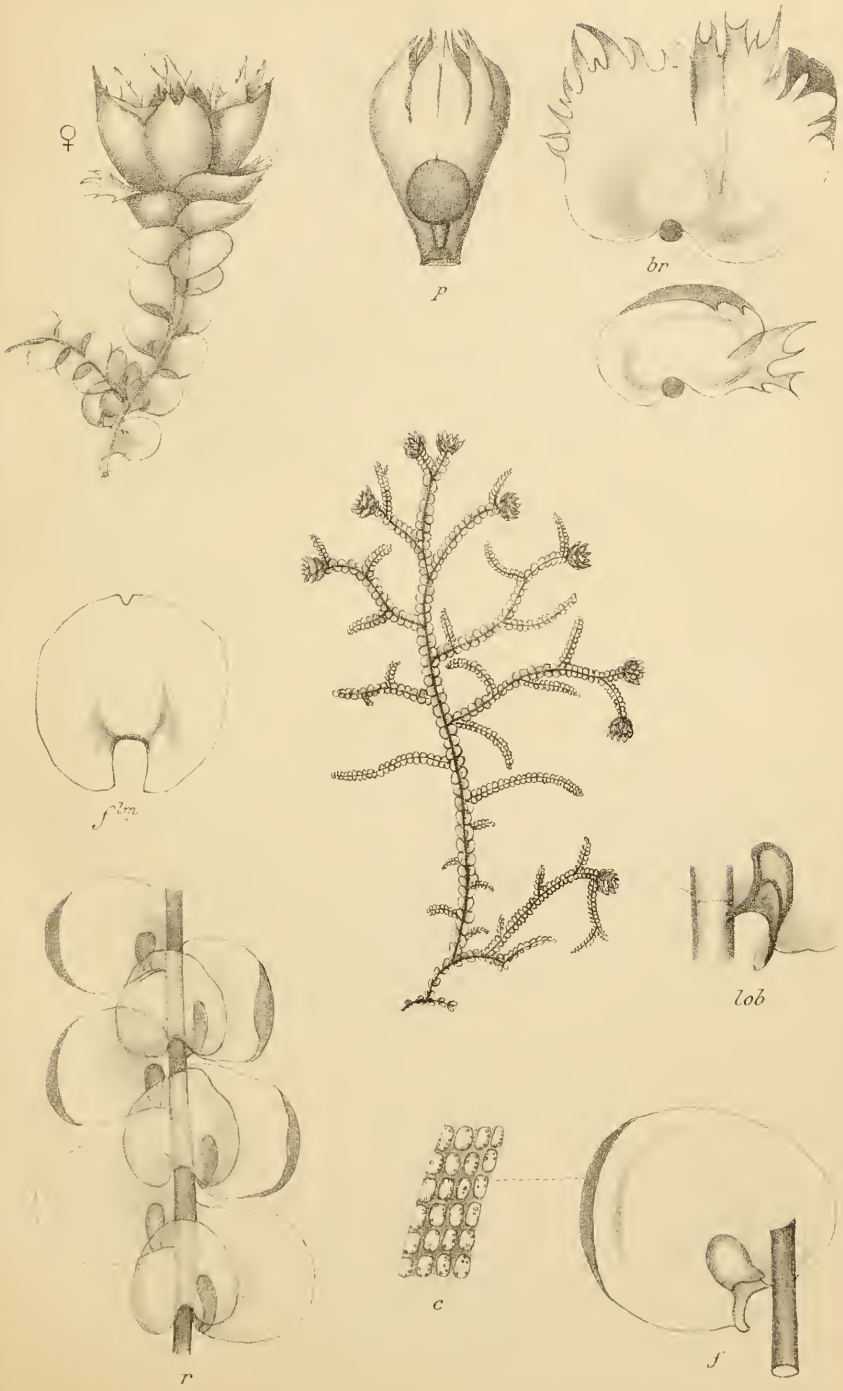
By all essential characters of inflorescence and fruit *Stictolejeunea* agrees exactly with other *Lejeuneæ Holostipæ*, viz., the monogynous ♀ flowers, the pedicel of 20 cells in each tier, the pale tender capsule, &c.—If any subgenera of *Lejeunea* merit more than others to be raised to the rank of genera, they are *Myriocolea* and *Stictolejeunea*. Nearly 30 years ago, after examining freshly-gathered specimens of the latter, and noting the anomalous insertion of the branches, the symmetrically dotted leaves, and the curious flattened perianths, I entered it in my MS. as a distinct genus, and sent it to correspondents under the name *Diotianthus Argus* nov. gen. et sp. Finding later that the plant had already been enumerated

among supposed varieties of *Lejeunea squamata* in the "Synopsis Hepaticarum," I had to quash my name; and for the subgenus the title I now adopt seems preferable.

It is curious that, although *Neurolejeunea* has a compressed two-eared perianth not very unlike that of *Stictolejeunea*, the insertion of the branches is different, being conformable to that of normal *Lejeunea*.

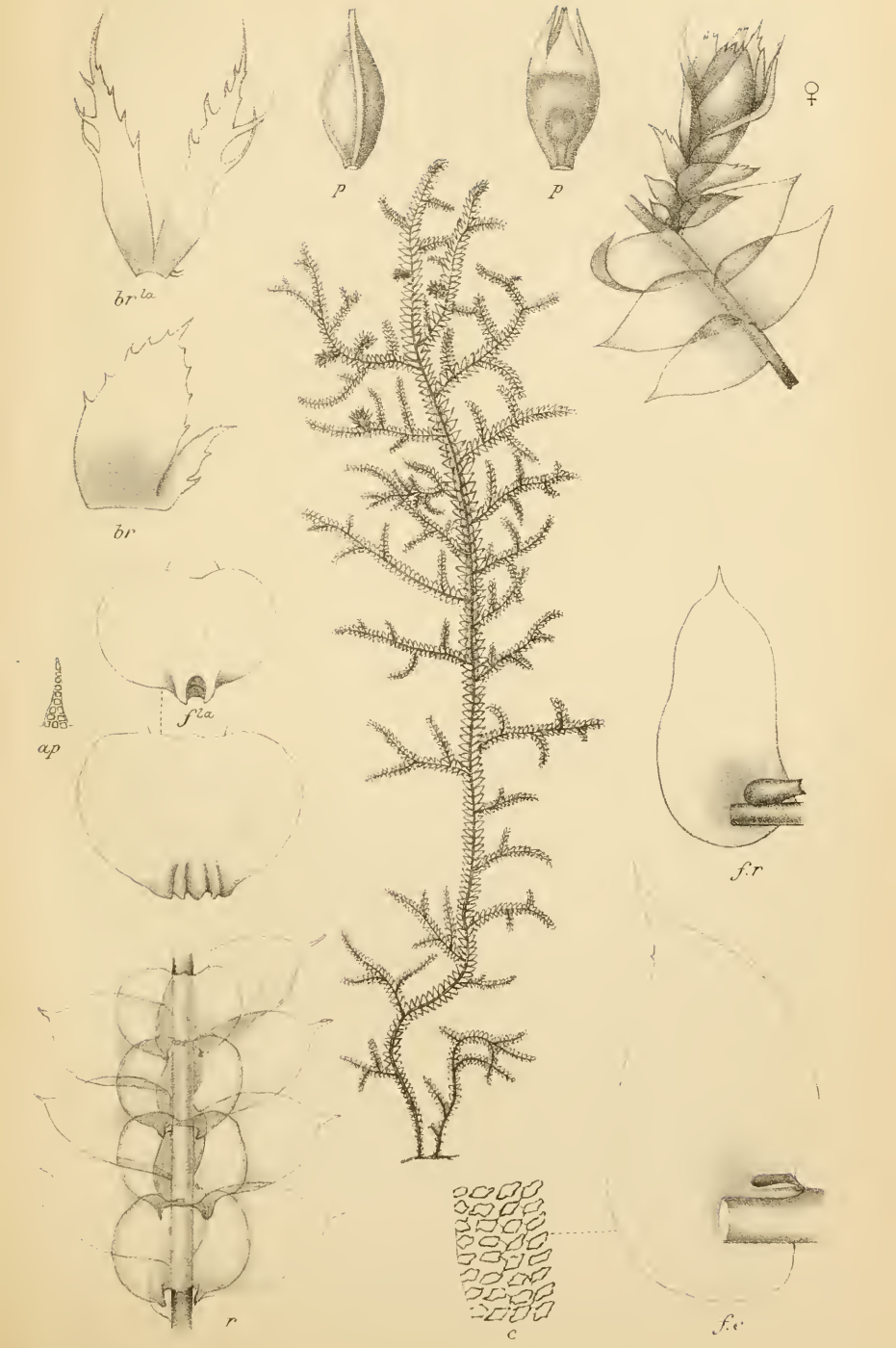
[Lector benevolus corrigat rogamus menda nominum sequentia.

P. 145, lin. 10 ab inf. pro "*Priono-L.*" lege "*Odonto-L.*"
P. 170, lin. 17 a sup. pro "*L. uncinata*" lege "*L. ancistrode.*"]



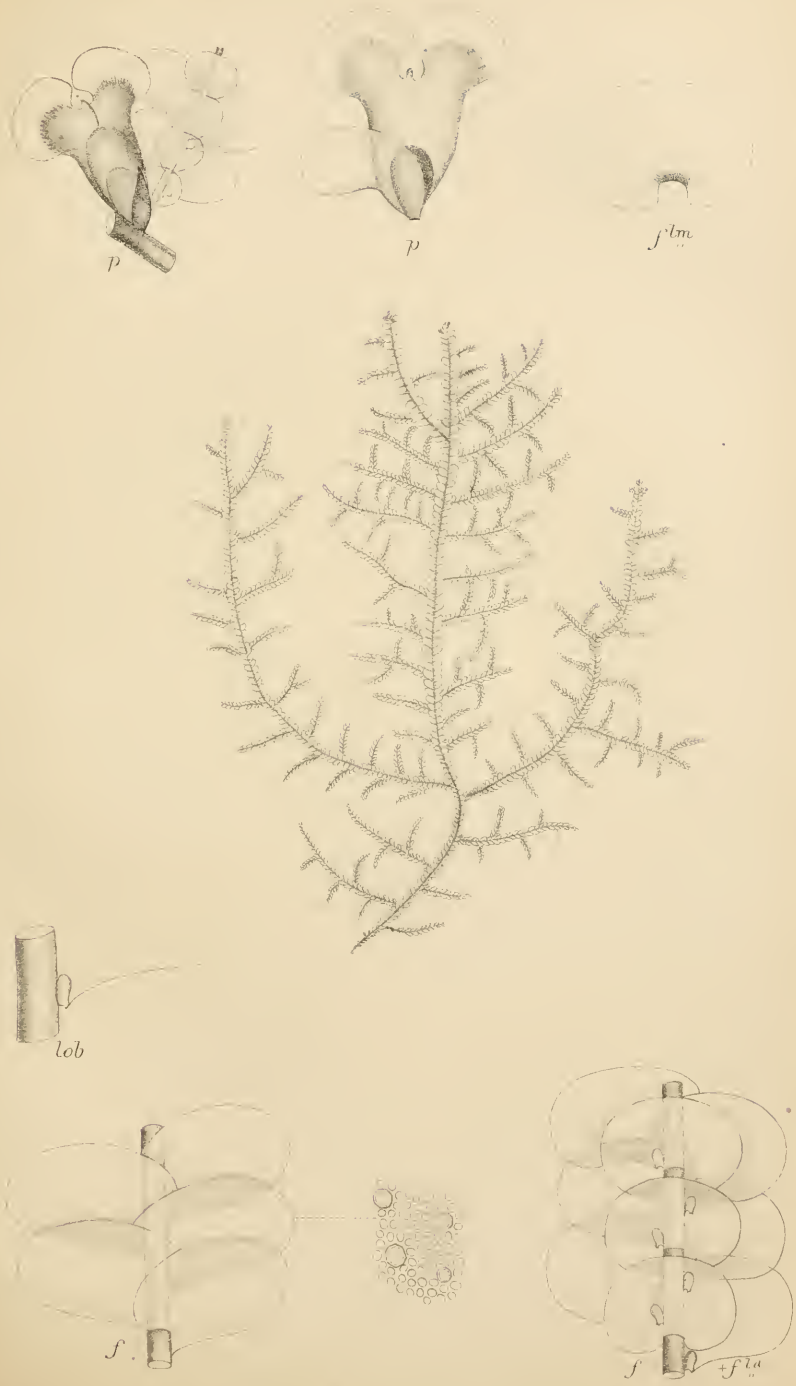
R. Braithwaite ad nat. del. F. Huth, Lith^r Edin^r

FRULLANIA SPHÆROCEPHALA.



F. Braithwaite ad nat. del. F. Huth, Lith. Edin.

FRULLANIA BICORNISTIPULA.



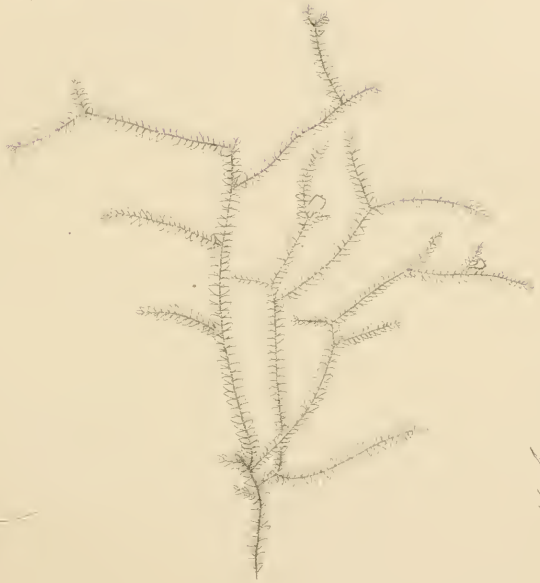
Braithwaite ad nat. del. E. Carter sc. Mintern Bros. imp.

STICTOLEJEUNEA KUNZEANA

p + inv

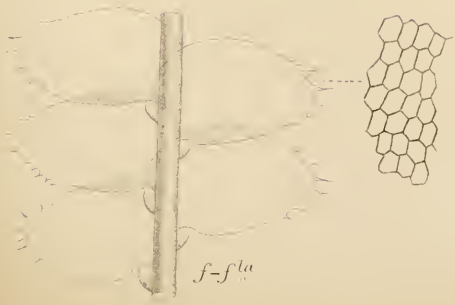
br la

f - lm

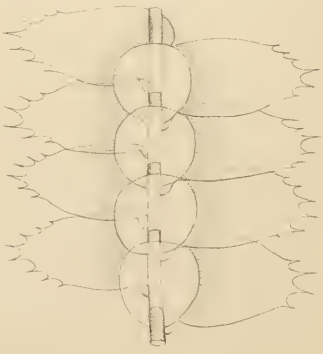


lob

br



f - f la



f + f la

E. Braithwaite ad nat. del. E. Carter sc. Mintern Bros. imp.

HOMALEJEUNEA PALÆFLORA

TRANSACTIONS AND PROCEEDINGS

OF THE

BOTANICAL SOCIETY.

VOL. XV.—PART II.

EDINBURGH:
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MDCCCLXXXV.

The Author has been prevented by illness from completing the Introduction which it was proposed to issue along with the second part of his Memoir on the Hepaticæ of the Amazon and of the Andes of Peru and Ecuador. As the printing of the descriptive portion of the work, and of the plates (22 in number), has long been completed, it has been decided to issue Part II. without further delay.

The work, as it stands, comprises, besides full descriptions of every species, notes under each tribe (or sub-tribe) and genus on the characters, habits, and distribution in equatorial America of the species comprised in it. The world-distribution of the few widely-dispersed species is added, so far as the materials at the Author's disposal enabled him to ascertain it. Synopses of the genera in each tribe, or sub-tribe, and of the species in each genus, or sub-genus, are also given, so that the work is technically complete.

The additional matter on the physical features of the regions explored, and their connection with the vegetation—especially the hepatic vegetation—with critical remarks on certain of the genera and species, the Author proposes (if he is able to complete it), to present to the Botanical Society in the shape of a Supplement to the work.

Tribus II.—*JUNGERMANIEÆ.*

Caules foliosi, raro frondosi, vario modo ramosi; rami in aliis generibus et speciebus omnes laterales, distichi; in aliis tristichi, ramis posticis pro more aut floriferis aut radicelliferis; raro monostichi, sc. postici, omnes e caulis facie inferiore orti; rarissime vel distichi, e caule antice et postice orti, vel tetrastichi. *Folia* quoad insertionem, formam et divisionem omni fere modo variabilia, nisi quod in foliis conduplicato-bilobis lobulus galeatus campanulatusve (ad *Frullaniæ* instar) in nullo genere, *Lepidolæna* et *Pleurozia* exceptis, obvius est. Folia opposita in quibusdam generibus—vel in aliis vel in omnibus speciebus—advenient; in cæteris pluribus alterna, sunt pro more sat lata, subrotunda vel magis elongata, integra vel sæpe bifida, lobis vel patulis vel complicatis, margine nudo vel dentibus ciliisve armato; in aliis generibus autem palmatifida, segmentis nunc subulatis, nunc setaceis, nunc capillaceo-ramosis. *Foliola* foliis pro more multo minora, sæpe subconformia; in speciebus oppositifoliis cum utroque folio collaterali connata; in plurimis speciebus normaliter deficientia. *Florescentia* in uno et eodem genere persæpe variabilis, autoica, paroica vel dioica, in paucis autem robustioribus constanter dioica, e.g. *Herberta*, *Bazzania* et *Plagiochila*. *Flores* ♂ semper fere spicati, sæpe ad ramulum posticum relegati; haud raro vel terminales, vel in caulis ramive medio positi. Bracteæ 1–2-vel oligandræ, rarissime polyandræ. *Flores* ♀ in aliis generibus constanter acrogeni, in aliis cladogeni, in paucis aliis nunc acrogeni nunc cladogeni. *Bracteæ* in speciebus acrocarpicis foliis utplurimum subconformes; in cladocarpicis autem sæpe sat diversæ, latiores, minus profunde divisæ, margine magis dentato incisove; in paucis generibus perianthio basi et altius adnatæ. *Pistillidia* plura, sæpe sub 20, ad 80 usque inveniuntur, nunquam (nisi ex abortione) ad 4 sola redacta. Perianthia in plurimis præsentia, forma varia, globosa—subulato-pyramidalia, nunc compresso-subplana, nunc plus minus

turgida et pro more angulata; ore vel constricto, vel ab initio lato, hiante, integerrimo vel denticulato, ciliato, &c., persæpe lobulato. [In plurimis generibus perianthii anguli primarii ad carinam mediam anthophyllorum respondent (*Hypogoniantheæ*); in aliis sutura marginali anthophyllorum constant (*Epigoniantheæ*). In *Epigoniantheis* solis invenimus frequenter perianthia ad angulos alata.] In paucis *Jungermanieis* perianthia omnino deficientia, in aliis vel cum involucro colligatum et confusum, vel incomplete evolutum, anthophylla 2 vel 3 parva sublibera sistens. Alia pauca genera (*Marsupiocarpeæ*) involucrum cum perianthio in sacculum carnosum pensilem concretum habent. *Calyptra* in plerisque obovata vel pyriformis, in aliis longa et angusta, in aliis globosa invenitur; nunc substantia pertenui nunc carnosa; aut perfecte libera aut (in paucis generibus) cum perianthio, vel cum receptaculo, vel cum utroque, plus minus alte connata. *Pedicellus* utplurimum sat longus, ad maturitatem ultra perianthium alte exsertus, interdum brevis; apice vix vel parum dilatatus, nunquam autem (ad Jubulearum instar) in apophysin tam latam et altam dilatatus ut capsula globosa solum ad $\frac{2}{3}$ longitudinis fissa adpareat; cellulis alternis conflatus, in ætate flaccidus vel collapsus, neque (ac in *Lejeunea*) ad speciem articulatus. *Capsula* longitudine varia, sphærica, ovalis, vel subcylindrica, bi-pluristrata, rarissime pro majore parte solum unistrata, cellulis strati intimi frequenter fibris semiannularibus fulcitis; ad basin usque 4-valvis, valvulæ integræ, rarius fissæ, rarissime irregulariter ruptæ, suturis autem basin versus aliquando inter se incomplete solutis; in plurimis generibus rectæ, in perpaucis spiraliter tortæ. *Elateres* valde numerosi, tota facie capsulæ interna primum insidentes, capsula dehiscente omnes decidui; vel pauci apicales basalesve, cæteris conformes vel diversi, paulo longius persistentes; angusti, utroque fine tenuiores, tortiles, plerumque dispiri, interdum 3–4-spiri, casu rarissimo alii monospiri. *Sporæ* numerosissimæ, utplurimum præminutæ, in paucis sat magnæ, semper fere globosæ, læves vel scaberulæ.

The *Jubuleæ* seem to me equivalent to nearly all the rest of the suborder *Jungermaniaceæ*. The structure of the capsule, and especially of the elaters, is unique among hepaticæ. So great is their abundance and variety in æquatorial forests, that they constitute fully half the species of the entire hepatic vegetation.

Jungermanieæ are essentially distinct from *Jubuleæ* by the following characters. Female flowers polygynous. Pedicel not at all, or scarcely, dilated at the apex—never into a segment of a sphere constituting a solid apophysis, nearly half the height of the cavity of the capsule, as in *Jubuleæ*

Capsule producing spores and elaters (the medial ones horizontal) on its entire inner surface, 4-valved down to the base (not merely to $\frac{2}{3}$ of the semicircumference). Elaters dispirous—only by rare exception monospirous—deciduous, either along with the bursting of the capsule, or a few of them persisting a while longer.

In the following summary of the characters of *Jungermanieæ* I shall dwell mainly on those which (even where not prevalent throughout the tribe) help to distinguish certain of the genera from all *Jubuleæ*. Although a few of the genera conform to *Jubuleæ* in being distichously branched in only one plane, in a great many genera postical branches also exist, usually either shortened down to an inflorescence, ♂ or ♀, or else bearing the rooting apparatus, along with rudimentary or obsolete leaves. In a few genera, postical branches alone are normally present, whether bearing flowers, or leaves or roots. Even antical branches are sometimes (but very rarely) seen. In *Radula* alone are the branches infrafoliar in insertion, as in *Lejeunea*; in all other genera the lateral branches are axillary to the side leaves, and the postical branches to the under leaves, where present, or, where absent, are subtended by a tuft of radicles.

Leaves very various in size, form, and insertion. In some genera incubous or transverse, in the great majority they are succubous. Several genera have opposite leaves in every species; in other genera some species have alternate, others opposite leaves; while in others every known species has alternate leaves. [But the leaves of *Jubuleæ* are invariably alternate; and it is only in the ♀ involucres of a limited number of species (chiefly of *Frullania*) that opposite and connate leaves (or bracts) are seen.] The leaves of *Jungermanieæ* vary from broad and round to linear and even setaceous, from quite entire to deeply laciniate. Complicate leaves are typical in a few genera; but the feature which prevails throughout *Jubuleæ* of a conduplicate-bilobed leaf, with the smaller underlobe either inflated, or partially inrolled, or cucullate—sometimes even bell-shaped or cylindrical—is almost unknown in *Jungermanieæ* except in the curious genus *Lepidolæna* Dum. (= *Polyotus* G.) from the S. temperate and antarctic zones, in *Pleurozia* Dum. (= *Physiotium* N.) and in a few *Radulæ*.

The under leaves go through much the same phases of form as the side leaves, and are sometimes, although smaller, more numerously divided (*e.g.* in *Lophocolea*); they are however more frequently altogether absent than in *Jubuleæ*.

The leaf-cells show all the variations of structure found in *Jubuleæ*, and are sometimes much more elongate, the basal ones occasionally enclosing spiral or annular fibre.

The ♂ inflorescence does not differ essentially from that of the *Jubuleæ*, and ranges through nearly the same limits, as to the number of the sexual organs, but it is often relegated to a postical branch, such as exists in no *Jubuleæ*. Many genera have constantly monandrous bracts, and in several they are oligandrous—rarely to be called polyandrous, although I have seen as many as ten antheridia together in *Gottschea laminigera* Tayl. The bracts have often a supplementary lobule or incurved tooth, at the antical base, veiling the antheridia. Even the frondose genera have the antheridia usually subtended by a leafy scale. In a few genera —some foliose, others frondose—the antheridia are not veiled by any side-leaves, but stand apart from the latter (where present) on the upper face of the stem, either quite naked or contained in little pits, and at

first covered by the upper cell-layer of the stem, which, breaking away, leaves them exposed at maturity.

The ♀ inflorescence is in some genera constantly acrogenous, in others as constantly cladogenous (quasi-lateral), and in a few genera both types coexist (*e.g.*, in *Radula*, *Cephalozia*, *Lophocolea*, &c.). In nearly all strictly cladocarpous genera, the ♀ flowers are postical; *Porella*, however, has them lateral. Bracts in the acrocarpous species usually subconformable to the leaves, although often more divided; in the cladocarpous species often very different: wider, either more numerously lobed or more cut at the margin. In a few genera the bracts—at least those of the innermost whorl—are adnate to the perianth up to a greater or less height. The number of the ♀ organs affords a notable distinction from *Jubuleæ*, the pistillidia being never solitary (as in *Lejeunea*), nor even so few as 4 (which is the limit in *Frullania*) but always at least 5, and usually many more: in some species indeed as many as 70 or 80.

The perianth, where present, corresponds to that of *Jubuleæ* in being formed by the marginal union of the innermost (and serotinous) whorl of bracts; and, where angular, as it mostly is, the primary angles are usually (as in *Jubuleæ*) the medial fold (or keel) of those bracts; but in certain genera the primary angles are not at the medial fold but at the connate edges of the bracts. In the former group (*Hypogonianthæ*), whenever the angles are reduced to three, the third angle is undermost, or postical; and if completely flattened, so that even that angle disappears, the flattening is frontal. In the latter (*Epigonianthæ*) the third angle is antical; and where the two lateral angles are replaced by a single postical angle, the perianth is flattened from the side. As a rule, it is only in the latter group that perianths exist with winged, or toothed keels.

In a few genera the perianth is entirely absent, or at least appears to be so. In *Leiomitra*, *Scalia*, and *Symphyogyna* it is certainly wanting, and the involucral leaves are also perfectly free from the calyptra. In *Trichocolea*, *Lepidolæna*, *Schistocheila* (*Gottschea*) &c., it is (if present) so closely soldered to the involucre as to be rarely distinguishable from it, and it is besides often adnate to the included calyptra. In *Marsupella* § *Acolea* the perianth is represented by 2 (or 3) small inner leaves, which are either quite free from each other or slightly connate, and are usually somewhat adnate to the involucre. In the curious pouch-fruited genera (of which no example is known among *Jubuleæ*) the perianth takes the form of a fleshy pensile sac, which in most cases buries itself in the earth or in soft decaying wood, but in *Tylimanthus* hangs among adjacent mosses. Several genera possess a character entirely unknown among *Jubuleæ*, viz., a perianth that is wide-mouthed throughout its existence, and therefore needs not to be ruptured for the emission of the capsule: such are *Plagiochila*, *Scapania*, *Radula*, *Lophocolea*, &c. The calyptra, as compared with the perianth, is of various lengths, being in some species scarcely at all shorter, but in others four times as short. Usually obovate, it is sometimes almost globose; while in *Radula* it is so much elongated as to become cylindrical or clavate, as it is also in the gymnomitrous genera *Scalia* and *Symphyogyna*. It is very often narrowed at the base into a neck, so as to be pyriform or even turbinate. Where the perianth is absent the calyptra is fleshy, and so it is also in certain species of various genera provided with a perianth, although it may be free from both perianth and receptacle. Where the receptacle, with the sterile pistillidia, is adnate to the calyptra, and carried up on it to a greater or less height, it adds one or more strata to the thickness of

the calyptra. This character of an inferior, or half-inferior calyptra occurring in several genera of *Jungermanieæ*, is quite unknown in *Jubuleæ*.

Pedicel of various lengths; in some genera (*Porella*, *Herberta*, *Plagiochila*, &c.) usually short, and very little emersed from the perianth, in all or most of the species; in others 60 or more cells long, and varying in actual length at maturity with the state of the atmosphere, being always more elongate when the weather is wet. The cells in contiguous longitudinal series are alternate, never opposite as in *Lejeunea*; although the pedicel of *Cephalozia* is of two concentric strata the inner of which consists of four series of cells, whose inner walls form a cross on the section, similar to that seen in *Lejeunea*. The pedicel in all this tribe is cylindrical at maturity, either only slightly or not at all enlarged at the apex; and is never, as in the *Jubuleæ*, dilated into a segment of a sphere, one-third the height of the whole globose capsule (into which it passes insensibly, and is usually considered to form an integral part of it).

Capsule varying in the different genera from globose to cylindrical, often preserving nearly the same form and the same proportion of length to breadth throughout each genus. It is formed in almost every genus of at least two, but sometimes of several strata, whereof the outermost is twice (at least) the thickness of the inner strata, and consists of more regularly tesselate (subquadrate or subrectangular) cells. The cells of the innermost layer in many genera and species contain spiral fibre, very rarely perfect, but mostly reduced to half-rings (semi-annular) whose convexity is towards the axis of the capsule. In a few aberrant genera, of few species, the capsule is wholly (or in great part) unistratous, *e.g.*, in *Scalia*. When ripe the capsule splits normally down to the base into four valves, which in a few species are again cloven, but unequally; rarely, and only in *Fossombronia*, is the dehiscence altogether irregular, and not (or only partly) along the valvular sutures.

Elaters numerous—sometimes to be counted by thousands—produced on the whole inner surface of the capsule, usually slender and tortuous, narrower at each end (never truncate), and each includes two spiral fibres —rarely three or more—very rarely only one. When the capsule bursts, they mostly fall out all together, along with the spores. In some genera a few of the apical elaters, and in others a few of the basal ones, persist for some time after the bursting of the capsule, and retain a good many of the free elaters entangled in them, but finally fall away. These "elater-holders," as they have been called, are usually (but not always) shorter and wider than the free elaters, and do not generally agree with them in the number of included spirals. They exist in some genera where they have not been noticed, as for instance in *Herberta* (*Sendtnera*).

Spores very numerous, and usually very minute, in only a few genera equalling those of the *Jubuleæ*; nearly always globose.

Subtribus I.—RADULEÆ.

Platyphyllæ Nees in Syn. Hep. 252, pro p.; *Jubuleæ* N. Hep. Eur. III.

Plantæ pro more sat elatæ, raro pusillæ, virides vel flavo-virentes,

emollitæ aquam cito flavido-tingentes, in cespites latos depressos arcte stratificatæ, vel e ramis pendulæ, raro in arborum foliis vivis strato simplice repentes. *Caules* laxe pinnatim ramosi, vel ex p. (raro ab initio) dichotomi; rami omnes laterales, infrafoliares, folii basi externa contigui, vix leviter adnati. *Folia* magna, ·75–3·0^{mm} longa, sat lata, alterna, incuba, integerrima vel solum angulata (in unica specie asiatica, autem, insigniter serrata) conduplicato-biloba, lobo inferiore minore plicam versus in mammillam radicelliferam elevato; cellulæ parvæ chlorophyllosæ plus minus opacæ. Foliola omnino nulla, nequidem ad florescentias. *Flores* omnium fere dioici, in perpaucis paroici: ♀ in unica sp. cladogeni, ramulo simplicissimo constantes; in cæteris acrogeni, basi innovatione singula, vel sæpius binis oppositis suffulti. *Bracteæ* unijugæ, foliis subminores, lobulo pro ratione majore eradicellifero, innovationi subjacenti parum adnatæ vel liberæ. *Pistillidia* 5–16. *Perianthia* tubæformia vel infundibulata, a fronte plus minus compressa, in aliis fere complanata, in perpaucis subteretia, rarissime carinata vel plicata, ore ab initio hiante subbilabiato et vel recte truncato vel crenato, raro 4-lobo. *Calyptra* anguste ovalis brevicolla valida subopaca, stratis cellularum tribus pertenuibus conflata. *Pedicellus* brevis, perianthium subduplo excedens, validus, cellulis 12–16 in diametro. *Capsula* flavida, plus minus elongata, plerumque ovali-cylindrica, triplo longior quam lata, solum in *R. Gottscheana* tam lata fere quam longa, ad basin usque 4-valvis, valvulis integris bistratis; cellulæ exteriores sat magnæ et altæ, tesselatæ, pariete moniliformi-incrassato; interiores longe tenuiores, lineares flexuosæ, badiæ, obscure transverse striolatæ, striis crebris tenuissimis obliquis, fibris semiannularibus autem ut videtur orbatæ. *Elateres* prælongi tenues obtusi arcte bispiri. *Sporæ* magnæ globosæ minute tuberculosæ. *Andrœcia* spicata, varie posita, plerumque in ramis terminalia; bracteæ 3–15-jugæ, equitantes, 1–2- (raro 3-) andræ.

IV. RADULA, Dum. emend.

Nees Hep. Eur. III. 143; G. L. et N. Syn. Hep. 253; *Radulæ* § 1. *Radulotypus* Dum. Comm. Bot. 112 (A. 1823), Syll. Jungerm. 38 (A. 1835).

Caracter generis unici in caractere subtribus continetur.

Hab. Ad arborum truncos ramosque, etiam ad rupes, raro in ipsa terra; unica species, in sylva Amazonica valde frequens, con-

stanter ad folia viva. Pleræque planitiem et montes humiliores, paucæ loca subalpina diligunt.

Distr. Per orbem terrarum, in terris tropicis frequentiores. Ipse in sylvis Amazonicis et Andinis species 13 carpsi, quarum 8 novas videntur.

Radulæ are about equally abundant in the forest-plains of the Amazon and on the wooded slopes of the Andes; but are usually of different species, those of the plains rarely ascending the hills. Few of the montane species reach an altitude of 2000 metres, but two of the finest, *R. ramulina* Tayl. and *R. Jamesoni* Tayl. are almost subalpines, growing sometimes up to 3000 metres.

Radula is apparently separated by a wide interval from every other genus. It has one unique character, viz., the attachment of the radicles to the under lobe of the side leaves, and not to the under leaves, or the underside of the stem, as in all other hepaticæ. In the branches springing from the outer base of the leaves it agrees with *Lejeunea*, and with no other. It has also, like *Lejeunea*, complicate bilobed leaves, with the under lobe smaller than the upper; but this character it shares with *Porella*, *Micropterygium* and a few others. *Radula flaccida*, the only species that grows on living leaves of trees, is externally so like certain *Lejeuneæ* which prefer the same habitat as to be easily mistaken for a species of that genus, especially for one of those that have no under leaves; but there the resemblance ends. In its most essential features it differs altogether from *Lejeunea*; *e.g.*, in the polygynous ♀ flowers; the macrostomous perianth; the stout pedicel composed of 6 to 8 (not of only 2) concentric layers of alternate cells; and (above all) the very numerous, long, slender, 2-*spired deciduous elaters*.

In the European *R. complanata* (Transoubât, Pyrenees) I find the capsule lined with a thin brown membrane down to the very base, even over the pedicel. This lining is of linear subflexuose brownish cells, on transverse section 4 or 5 times thinner than those of the outer layer, and there are certainly in some places 2 inner layers, both of which are apt to secede in fragments, although by no means so deciduous as in *Porella*. It seems elateriferous throughout, and the faint transverse striæ of the cells are possibly the remains of an annular (or spiral) fibre. In *R. ramulina* (Quitenian Andes) the base of the capsule, over the pedicel-apex, is composed of large, pale, unequal-sided 5–6-angular cells, and is not covered by the continuation of the valvular lining, yet seems equally elateriferous.

SUBGENUS I.—*CLADORADULA*.

Flores ♀ *eladogeni, ramulo brevissimo simplice constantes. Capsula oblongo-globosa, perpaulo longior quam lata.*

1. *R. Gottscheana*. Elata laxe bipinnata. F. caulina ad basin fere usque bipartita; lobo ovato-orbiculato; lobulo duplo breviore, a caule sublibero, bifido (*i.e.* auricula æquimagna aucto); cell. minutulis. Br. floris ♀ lobis oblongo-lingulatis. Per. campanulata, quadrangula, parum compressa, ore 4-loba.

SUBGENUS II.—*ACRORADULA* (*sive RADULA* typica).

Flores ♀ *in caule vel in ramo longiore terminales, hinc vel utrinque innovatione suffulti. Per. elongata, plerumque valde compressa, raro (præter ad basin) teretia, rarissime carinis percursa. Capsula oblongo-cylindrica, triplo fere longior quam lata.*

A. Ramificatio ab initio dichotoma, ramulo singulo rarius hic illic interjecto; raro inferne subpinnata superne dichotoma.

2. *R. Cornucopiæ.* Elata dichotoma. F. contigua longe decurrentia, lobo ovato-rotundo supra lobulum 3-plo breviorem triangularem inflatum patulo, c. parvis. Br. ♀ minutæ, foliis 3-plo breviores. Per. cornucopiæformia, teretia, ore dilatato recurvo.
3. *R. episcia.* Majuscula, inferne laxe bipinnata, superne dichotoma. F. subimbricata late ovato-orbiculata caulem haud obvelantia, lobulo 3-plo fere breviore rhombeo obtuso, c. minutulis.
4. *R. pallens.* Mediocris. iteratim dichotoma. F. subimbricata parum divergentia, lobo late semicordato-oblongo rotundato, lobulo plus 3-plo breviore subrhombeo obtusato, c. parvis. Br. foliis duplo minores. Per. tubæformia recta subplana, basi sensim angustata, ore truncato brevissime 4-lobo crenulato.
5. *R. pseudostachya.* Rigida parce subdichotoma, ramis e foliis superioribus semideciduis apice spurie spicatis. F. opaca fragilia, lobo falcato-oblongo, inferne cum lobulo duplo breviore ovato-trapeziformi in sacculum complicato, supra lobulum valde divergente. Br. foliis æquimagnæ.
6. *R. pusillà.* Tenuis, nisi pro caulis apice furcato, flore ♀ in furca, sæpe subsimplex. F. subimbricata, lobo oblongo-rotundo supra plicam late divergente, lobulo plus duplo breviore trapezoideo subacuto, c. parvulis convexulis. Br. ♀ foliis subæquilongæ. Per. tubæformia compressa subincurva, ore lato crenulato.

B. Ramificatio magis minusve regulariter pinnata, ramis autem persaepe sub flore ♀ *furcatis.*

7. *R. flaccida.* Tenella pinnata et bipinnata. F. subimbricata, subrecte complicata, lobo late ovato-oblongo rotundato subtruncatove, lobulo 3-plo breviore rhombeo apice vario, interdum subacuminato, c. parvis. Br. foliis breviores multo angustiores. Per. sæpius pralonga subclavata, ore 4-crenato, in *var.* breviora subcampanulata.
8. *R. amazonica.* Majuscula primum pinnata vel bipinnata. F. imbricata subplana, lobo late oblongo rotundato supra lobulum rhombeum subacutum vix triplo breviorem falcato-divaricato, cellulis parvis. Br. foliis conformes. Per. a basi obconicâ lato-linearia compresso-plana, ore bilabiato crenulato vel breviter 4-lobulato.—Var. *Negrensis.* Elata arctius pinnata, ramis ♀ brevibus, innovatione plerumque unilaterali.—Var. *Campanensis.* Subbipinnata. F. utraque basi cordata. Per. breviora albida.
9. *R. riparia.* Elata pallida. F. subimbricata patentissima ad plicam decurrentia, lobo semicordato-subrotundo basi caulem transeunte, lobulo 3-plo breviore subplano rotundo-rhombeo obtusato, c. parvis. Br. foliis subconformes. Per. clavata compressula basi longe attenuata, ore repando.
10. *R. Jamesoni.* Elata laxe pinnata et bipinnata. F. contigua magna, lobo late semicordato-ovato basi antica caulem latissime superante,

lobulo 2-3-plo breviore rhombeo, apice (interdum elongato) retuso vel obsolete 2–3-fido. Per. . . . . .

11. *R. ramulina.* Elata flaccida flavida albicansve crebre pinnata et bipinnata, ramulis sæpe brevibus microphyllis. F. magna subcontigua patentissima, basi cordata caulem utrinque latissime transeuntia, lobo oblique oblongo rotundato, lobulo vix duplo minore semicordato-rhombeo, medio margine externo apiculato, c. parvis. Br. foliis duplo minores erectæ appressæ, lobis oblongis. Per. alte emersa aurantiaca compresso-clavata, ore repandulo.
12. *R. viridi-aurea.* Majuscula tenera flaccida laxe pinnulata. F. late imbricata patulo-devexa, lobo semicordato-ovato-rotundo, basi caulem transeunte, lobulo 3-plo breviore semicordato-rotundo caulem parum superante, c. parvulis. Per. . . . . .
13. *R. involvens.* Elata flaccida rufo-badia laxe pinnata. F. subimbricata supra basin turgide complicatam falcato-divergentia, facie papulosa, lobo semicordato-ovato-oblongo rotundato, basi caulem obvelante dimidio supero involuto, lobulo subtriplo breviore trapezoideo sæpe bis implicato, cellulis parvis opacis, trigonis angularibus pellucidis.

1. RADULA GOTTSCHEANA Tayl. (Tab. XI.)

Lond. Journ. (1846) ; Syn. Hep. 724.

Hab. Andes Quitenses, alt. 1200^{m}, ad arborum truncos ramosque in sylva *Canelos* et monte *Chimborazo* (fertilis) ; in arbuscularum ramulis ad *S. Gabriel* fluvii *Negro* (sterilis) : R. S. a. 1852–1860 ; ad fluvium *Sabanilla* prope *Loja* (MASSEE, 1869). Ins. *San Domingo* (hb. DICKSON).

F 1·6×1·3, 1·3×1·25, lob ·85–·65, *f. ramulina* ·6×·35, c $\frac{1}{10}$; *br. lobus an.* 1·3×·5 ; *per* 2·0×1·1 ; *cal* 1·35×·8 ; *caps* 1·0×·75^{mm}.

Cæspites magni virescentes, inferne flavo-badii. Caules 6-9-pollicares, rufo-badii, laxe bipinnati, basi denudata sola matrici adfixi, dein recurvi subpenduli.

Folia contigua, basi ipsa subimbricata, subdivergentia, caulina ad basin fere usque bipartita ; lobus caule breviuscule incurrens, oblique ovato-orbiculatus repandus planus ; lobulus duplo brevior, a caule subliber, carinâ perbrevi decurrente cum lobo connatus, ovatus, caulem oblique transiens, basi externa in auriculam æquimagnam reniformem recurvo-crispam, angulo subrecto extantem, dilatatus ; cellulæ minutulæ, ad angulos incrassatæ, ambitu interiore lineam duplicem 6-sinuatam monstrantes. F. ramea paulo minora, minus profunde fissa, carina longiore, lobulo basi brevius auriculato ; ramulina triplo fere minora, oblonga, falcata, basi cum lobulo exauriculato in sacculum triangularem complicata.

Flores dioici : ♀ in ramo perbrevi decurvo terminales, innovatione nulla suffulti. Folia rami ♀ bi-trijuga ; omnia pro bracteis habenda, intima appressa, ad $\frac{3}{4}$ biloba, complicata, lobis oblongo-lingulatis rhomboideisve, postico duplo fere breviore.

Perianthia foliis caulinis paulo longiora, campanulata vel urceolata, parum compressa, ore hiante ad $\frac{1}{3}$ longit. 4-loba, lobis crenatis crispis sæpe recurvulis. Adveniunt quoque perianthia ad basin fere usque quadriloba, lobis duobus posticis subangustioribus ; alia minus profunde fissa, angulis 4 (aliis vel omnibus cristatis) percursa. Calyptra = perianthii $\frac{2}{3}$, turbinata, firma, demum apice disrupta. Capsula

perpaulo minor, oblongo-globosa, ad basin usque quadrivalvis. Elateres prælongi torti bispiri, utrinque obtusi. Sporæ magnæ, elateres diametro quadruplo excedentes, globosæ læves.

Obs. The abnormal, quadrangular and quadrifid perianths, plainly show that organ to originate in two bilobed leaves. Where the sutures are cristate, it arises from the lobes being accrete, not exactly by their edges, but with the edge of the one projecting a little beyond that of the other as a salient wing, or crest.

In the Rio Negro plant the leaves slightly overpass the stem at the antical base, in that from the Andes they barely cover it, and that is the only tangible difference.

2. RADULA CORNUCOPIÆ Spruce.

Hab. in montis *Chimborazo* devexis sylvaticis, alt. 1200^{m}, e ramulis pendula.

F 1·8 × 2·6, 2·0 × 2·5; *lob* ·7 × ·6; *c* $\frac{1}{4.5}$; *br* ·6–·7; *per* 3·8 × ·6 (*medio*) × 1·1 (*ore*); *caps* 1·5 × ·55^{mm}.

Elata rufo-badia, superne flavo-viridis. Caules 4–6- pollicares flaccidi, bis terve dichotomi, raro ramum alternum unum alterumve proferentes.

Folia basi sola contigua, ad plicam longe anguste decurrentia, supra lobuli sinum abrupte patula, oblique ovato-rotunda repandula; lobulus subtriplo minor oblique triangularis supra caulem alte incurrens et cum lobo sacculum dimidiato-infundibuliformem efformans, apice libero rotundatus, margine interno late incurvus; cellulæ parvæ æquilateræ valde opacæ.

Flores dioici: ♀ terminales, innovationibus oppositis—raro una sola—suffulti. Bracteæ minutæ, foliis triplo breviores, lobis oblongis, inferiore duplo minore.

Perianthia foliis duplo longiora, angusta, incurva, tubæformia—potius forma fere cornucopiæ, sc. e tubo longo clavato (perfecte tereti, nec compresso) apice in limbum duplo latiorem recurvum undulatum (subinde hinc emarginatum) dilatata. Capsula cylindrico-oblonga perianthio 2½-plo brevior, in pedicello brevi exserta.

Folia basi antica lata, haud vero semicordata, caulis dimidiam latitudinem solum velantia, media basi longe decurrentia, exinde utrinque supra caulem alte incurrentia, sacculum basalem semiobconicum efficientia.

3. RADULA EPISCIA Spruce.

Hab. ad fluvium *Pastasa* Andium Quitensium, in rupibus umbrosis humectatis ad fl. *Verde* ostia, alt. 1400^{m}, etiam in spelunca *Sicsihuaico* dicta, alt. 1800^{m}.

F 1·5 × 1·5, *lob* ·55 × ·55, *c* $\frac{1}{60}$^{mm}.

Majuscula flavo-viridis, denique subolivacea, prostrata. Caules 3-pollicares laxe bipinnati, apice subdichotomi; rami rubri flexuosi, inferiores prælongi.

Folia contigua vel subdissita, late patula, complicato-biloba; carinâ subrectâ, angulo axillari sub 70°, ipsa basi subdecurrente; lobus oblique late ovato-orbiculatus subconcavus, caulem haud obtegens; lobulus triplo fere brevior planiusculus subrhombeus obtusangulus et (idem ac lobus) in caule alte incurrens; cellulæ minutulæ æquilateræ leptodermes opacissimæ.—Flores nullos invenire potui.

Var. *opaciuscula* S. Differt cellulis certe majoribus minus opacis, endochromio annulari. Folia olivacea, superiora flavida, oblique orbiculata, carina subconcava, lobulo plus triplo breviore rhombeo obtuso plano v. incurvulo.—*F.* 1·25 × 1·25, *lobulus* ·35 × ·35, *c* $\frac{1}{40}$mm. *Hab.* Andes Peruvianos in monte *Campana*.

4. RADULA PALLENS (Sw.).

Jungermania pallens Sw. Prodr. Fl. Ind. occ. 143. *Radula pallens* (Sw.) Nees, Syn. Hep. 256.

Hab. in arborum cortice, ad fl. Amazonum ostia, loco *Tauaú*; in Andium radicibus ad rivulum *Marona-yacu* prope *Tarapoto*, necnon in monte *Campana*. Per Americam tropicam, in insulis Caribæis præcipue, vulgata videretur.

F 1·4 × 1·0, *lobulus* ·4 × ·4; *c* $\frac{1}{50}$; *br* ·75; *per* 3·0 × 1·0; *cal* 2·3 × ·8; *caps. valvulæ* 1·25 × ·25mm.

Mediocris, raro elata, flavo-viridis strato tenui crescens. Caulis 1–3-pollicaris iteratim dichotomus.

Folia subimbricata, parum divergentia, complicata, plicâ concavâ (sursum arcuante) basi anguste subdecurrente; lobus late oblique oblongus rotundatus repandus, basi subsemicordata caulem vix obtegens; lobulus plus triplo brevior subrhombeus obtusatus subincurvus; cellulæ parvæ prominulæ subopacæ leptodermes.

Flores dioici: ♀ dichotomiales. Bracteæ foliis subduplo minores, lobulo apice magis protracto.

Perianthia foliis plus duplo longiora, tubæformia, recta, fere plana, basi sensim longiuscule angustata, ore truncato brevissime 4-loba, crenulata. Calyptra magna (= perianthii $\frac{3}{4}$) longe pyriformis, basi attenuata, apice in lobos 3 breves inæquales fissa. Pedicellus perianthio vix duplo longior, apice subincrassatus. Capsula longe oblonga; valvulæ lineares obtusatæ, evacuatæ suberectæ marginibus recurvis.

Planta ♂ tenuior; andrœcia in ramis terminalia, tenuia julacea, bracteis 6-jugis.

Exemplaria ex insula *Dominicæ*, a cl. MONTAGNE sub nom. *R. pallens* Sw. communicata, cum meis perfecte congruunt. Frustula ex ipso Swartzio, in *Jamaica* lecta, examinavi, quæ specifice diversa videntur, foliis majoribus, lobo suborbiculato.

5. RADULA PSEUDOSTACHYA Spruce.

Hab. ad arborum ramulos in sylvis fl. *Negro* juxta S. *Carlos*.

F ·9 × ·6 (*supra lobulum*) × ·75 *ab ipsa lobuli basi*; *c* $\frac{1}{60}$mm.

Flavida arcte intricata depressa. Caules 1–1½-pollicares, rigidi, basi repente ex p. denudati, superne a matrice liberi, parce et subdichotome ramosi; alii rami elongati, e foliis medio disruptis (ad sacculum basalem redactis) spicam masculam fingentes.

Folia opaca fragilia convexa arcte imbricata, caulem antice vix obtegentia, postice cum lobulo duplo breviore ovato-trapeziformi (basi sublongitudinali alte incurrente inserto, apice brevi obtuso) dimidio infero in sacculum compressum complicata; plica convexa primum e caule angulo recto exiente, deinde abrupte suboblique ascendente, ad carinam inflatam rhizophora; lobus falcato-oblongus supra lobulum

divergens, basi apiceque rotundatus; cellulæ minutulæ, ambitu late opacæ, pariete ad angulos parum incrassato.

Flores dioici: ♀ sæpius dichotomiales. Bracteæ foliis æquales, suberectæ, plica concava, lobis oblique oblongis, inferiore vix duplo breviore. Pistillidia pauca (5).

Species distinctissima cujus flores invenire non potui.

6. RADULA PUSILLA Spruce.

Hab. ad radices Andium Quitensium juxta fl. *Bombonasa*, in cortice.

F ·85 × ·6 (× ·8 *ab ipsa basi*), *lobulus* ·35 × ·25; *c* $\frac{1}{50}$; *per* 2·4 × ·9 mm.

Pusilla pallide viridis, strato tenui effusa. Caules pollicares subsimplices, apice florifero trifidi, sc. innovationes duas breves oppositas sub flore ♀ proferentes; cæteri rami (quando adsint) sæpe florem ♀, cum innovatione unilaterali, gerentes.

Folia subimbricata, basi ultra $\frac{1}{3}$ alt. acute complicata, carinâ rectâ angulo 45° ascendentia, dein angulo 90° fere à caule divergentia; lobus oblongo-rotundus; lobulus plus duplo brevior trapezoideus subacutus, cauli alte adnatus, margine interno cum carina angulum rectum formante; cellulæ parvæ subæquilateræ opacæ prominulæ (unde folia celluloso-crenulata evadunt).

Flores dioici: ♀ terminales, innovatione suffulti; bracteæ suberectæ, foliis subæquales, lobulo paulo majore rotundato.

Perianthia tubæformia (juniora subinfundibuliformia) subincurva compressa, ore lato 6–7-crenulato.

R. tenella Gottsche (Mex Leverm. p. 149, ad pedem), insulâ *Trinidad* a Crüger lecta, differt foliis ovatis, lobulis quadratis.

7. RADULA FLACCIDA Ldng. et G. ?

Syn. Hep. 726; Gottsche, Mex. Leverm. 148?—*Radula foliicola* Spruce Mst.

Hab. in sylva Amazonica ubique ad arborum folia viva, interdum ad herbas nobiliores (*Marantæ*, *Caladii*, &c. species), necnon in filicibus. In Andibus infra 600m alt. desinit.

F ·75 × ·65, ·75 × ·75, ·8 × 1·0, *lob* ·2–·3, *c* $\frac{1}{50}$; *br* ·6–·7; *per* 2·0 × ·5, 5·5 × ·6mm.

Tenella, viridis, strato simplice matrici arcte adrepens. Caules $\frac{1}{2}$–1 poll. longi, pinnatim ramosi, ♂ cum ♀ sæpe intertexti.

Folia subimbricata, plana, in sicco plerumque recurvo-assurgentia, late oblique ovato-oblonga rotundata, subtruncata, vel subretusa, basi antica subsemicordata, postica decurrentia, latitudine in infima basi longitudinem interdum superante, ad $\frac{1}{3}$ altitudinis subrecte complicata; lobulus subtriplo brevior, rhombeus, subplanus, ad mammillam radicelliferam (plicæ contiguam) convexus, raro conico-prominulus, apice acutus obtususve, subinde elongatus et subacuminatus; cellulæ subopacæ, mediæ parvæ, submarginales fere minutæ.

Flores dioici: ♀ terminales, innovationibus duabus oppositis, raro una sola, suffulti. Bracteæ 2, foliis breviores, multo angustiores, erectæ, lobis rhomboideo-ligulatis, antico apice rotundato, postico $\frac{1}{2}$ breviore sæpius acuto.

Perianthia bracteas 3–4-plo superantia, anguste tubæformia vel clavata, inferne fere teretia, superne compressula, ore subbilabiata 4-crenata;

juniora elongato-campanulata, rarissime inveniuntur perfecte matura eâdem formâ. Calyptra clavæformis. Capsula oblongo-cylindrica. Andrœcia in ramis terminalia teretia; bracteæ 3–15-jugæ, equitantes concavæ subæquilobæ.

Var. brachycalyx. Forma pulchra flavida bipinnata. Folia caulina valde recurvo-assurgentia, minus opaca. Perianthia brevia, lata, anguste obconica poculæformiave, aliis paucis autem normali longitudine immixtis.

This is the only *Radula* which grows uniformly and solely on living leaves, whether of trees and shrubs or of robust perennial herbs, such as Aroids and Marants, or of ferns. It abounds throughout the Amazonian plain, from Para to the sources of the Negro and Orinoco, and to westward it ceases in the first undulations of the Andes, at Tarapoto in Peru and on the river Bombonasa in Ecuador: that is, below 2000 Eng. ft. If any described species, it can only be the Mexican *R. flaccida* L. et G., which grows on *leaves* of "*Psychotriæ cujusdam*," and therefore in a warm climate, for no *Pyschotria* ascends the mountains. The leaves of *R. flaccida*, however, are said by Gottsche to be twice as long as broad ($\frac{1}{3} \times \frac{1}{6}$ lin., $\frac{1}{2} \times \frac{1}{4}$ lin.) and to be merely obtuse, whereas our plant has them nearly, or quite, as broad as long, and occasionally the breadth at the very base is greater than the length, while the apex is widely rounded or subtruncate. These differences rendering its indentification with the Mexican plant doubtful, I have called it in my Mst. *R. foliicola.*

I gathered specimens in perfect state in a vast number of localities, but after sedulously comparing them, I must reduce them all to a single species, which varies mainly in the length of the perianths and of the male spikes. When young the perianth is narrow-campanulate, but rarely preserves that form at maturity, and usually lengthens out until it assumes the shape of a trumpet or club, 3 or 4 times as long as broad. Where a great majority of the perianths stop considerably short of the normal elongation, we have the rare variety *brachycalyx*, which, however, differs in no other respect from the typical form. The ♂ spikes vary greatly in length, even on the same plant, and I have seen them with as many as 15 pairs of bracts, but never with fewer than 3 pairs. Parallel differences are observable in several other *Radulæ*, and the length of the perianths, or of the ♂ spikes can never be relied on as a specific distinction until the limits of its variation have been accurately ascertained.*

8. RADULA AMAZONICA Spruce.

Hab. per sylvam Amazonicam ad arbores saxaque frequens. *Caripi*, prope *Para*, ad rupes maritimas. *San Carlos*, aliisque locis secus fl. *Negro*, in cortice. Ad fl. *Orinoco* supra cataractas, in cortice.

F. lobus 1·3 × 1·15, *lobulus* ·5 × ·5; *c.* $\frac{1}{45}$; *per* 2·8 × 1·1^{mm}.

Fulvo-viridis, in plagas latas effusa. Caules circiter bipollicares, implexi, subflexuosi, laxe pinnati, pro more apice semel vel iteratim dichotomi; rami inferiores breves simplices, rarius innovando-floriferi.

* Ad fl. *Bombonasa*, in filicis fronde, *Radulæ* specimina prepauca legi, forsan ad *R. tenellam* G. Mex. Leverm. 149 referenda. Pusilla viridissima fragilis. Folia haud recte complicata, lobo autem a plicæ apice plus minus divergente; lobulo mammilla prælta conica instructo. Perianthia tenuia, ore crenata, longitudine varia.

Folia ad $\frac{1}{3}$ lat. usque imbricata, supra lobulum divaricata, subplana, a basi (semicordatâ caulem transeunte) ultra $\frac{1}{3}$ complicata angulo plicam inter et caulem 45°–60°; lobus late oblongus, subfalcatus rotundatus repandulus; lobulus triplo fere brevior, subrhombeus obtusus vel subacutus, planus, subappressus, solum ad carinam parum inflatus, basi in caule alte incurrens; cellulæ parvæ conformes subæquilatero-hexagonæ leptodermes convexulæ, ambitu ex endochromio late opacæ, solum in centro pellucidæ.—Mammilla radicellifera ad medium lobulum, juxta carinam, posita, humiliuscula.

Flores dioici: ♀ in dichotomiis, etiam in ramis monotropice innovandis quasi-laterales. Bracteæ foliis conformes, nisi pro lobulo longiore dimidium lobum æquante.

Perianthia flavida foliis duplo longiora, subrecta, a basi brevi obconicâ lato-linearia, compressa, ore truncato bilabiata et vel repando-subcrenulata vel utraque facie medio breviter fissa exindeque 4-lobulata.

Andrœcia medio caule ramove posita, foliis consecutiva, vel ramulum totum sistentia; bracteæ sub 5-jugæ, foliis vix minores, erectiores, dimidio inferiore sacculum oblongum erectum constantes, lobulo dimidium lobum superante apice ovato-rotundato.

Var. *Negrensis* S. Major, 3–4-pollicaris flavida fulvave. Caules arctiuscule pinnati, raro subbipinnati; rami breves, medio (ad speciem) florem ♀ gerentes, revera apice floriferi, innovatione recte continua prolongati. *Hab.* ad *San Carlos* del *Rio Negro*.

Var. *Campanensis* S. Subbipinnata. Folia utraque basi cordata. Perianthia *albida* subbreviora, ore brevissime 4–5-loba et crenulata. *Hab.* M. *Campana*, in cortice, alt. 1200^{m}.

Obs. This is the commonest corticolous species of the Amazonian plain, yet I can nowhere find it described. The Mexican *R. subinflata* of Lindenberg and Gottsche seems the nearest, and many of its characters are the same; yet nothing is said of the strongly divaricate leaves—a marked feature of our species, distinguishing it from all other South American ones except *R. pseudostachya*, nor are the perianths said to be compressed, whereas our plant has them much flattened, and (the short obconic base excepted) of equal breadth throughout, so as to be ligulate, or broadly linear, in outline. The lobule is slightly bullate at the root-bearing mammilla, but not so much so as in some other species, described in Syn. Hep., where it is not considered worthy of mention.

Radula amazonica grows throughout the Amazon Valley, from the mouth of the Amazon to the cataracts of the Orinoco on the north, and on the south-west ascends the Peruvian Andes to about 4000 feet on Mt. Campana. It grows always on the bark of trees, whereas its near ally, *R. riparia*, grows on shady rocks by streams; and *R. flaccida* Lind. et G. always on living leaves, whether of trees and shrubs, or of palms, or of perennial herbs and ferns.

The variety *Campanensis* looks distinct, from the whitish perianths, but I can find no good character to separate it from the type.

9. RADULA RIPARIA Spruce.

Hab. Tarapoto Andium Peruviæ, ad rupes umbrosas in rivuli ripis.

F 1·6 × 1·2, 1·4 × 1·25, *lobulus* ·5 × 5; *c* $\frac{1}{50}$; *per* 3·0 × ·75^{mm}.

Elata pallide flava substratificata. Caules 3-pollicares inæqualiter pinnati, ramis ♀ furcatis.

Folia subimbricata—ramorum sterilium subdissita—patentissima vel

subdivergentia, a basi ad $\frac{1}{3}$ alt. integra et complicata, plicâ concavâ decurrente (f. rameorum præcipue), dein biloba ; lobus late semicordato-oblongus vel subrotundus, basi caulem transiens, apice rotundato angulato-repandus ; lobulus rotundo-rhombeus subplanus, caule alte incurrens, obtusatus vel late retusus ; cellulæ parvæ æquilateræ leptodermes opacæ convexulæ.

Flores dioici : ♀ dichotomiales ; bracteæ foliis perpaulo minores, vix diversæ, patulæ.

Perianthia foliis duplo longiora, clavata vel anguste infundibuliformia, compressula, basi sensim longe attenuata, apice incurvulo repando-truncata.

Planta mascula subbipinnata. Amenta vel ramulum totum vel ejus apicem mediumve solum tenentia, julacea ; bracteæ 5–10-jugæ, foliis duplo minores, a basi ultra medium erectæ saccatæ, apice oblongo-rotundo angulato vel subdenticulato patulæ ; lobulus vix duplo brevior rhomboideus obtusus.

A. *R. amazonica* S. differt foliis rotundioribus, ad carinam magis decurrentibus, præcipue autem perianthio elongato basique longius attenuato. *R. subinflata* Ldng. et G. lobulum habet inflatum acutum.

10. RADULA JAMESONI Tayl.

Lond. Journ. Bot. (1846) p. 374.

Hab. Andes Quitenses, prope *Pallatanga*, ad truncos saxaque, alt. 2200^{m} ; M. *Pichincha*, terrestris in sylvis ad aggeres umbrosos, alt. 3000^{m}. In arborum truncis montis *Cayambe*, alt. 3900^{m} primum legit W. JAMESON.

F. lobus 3·0×2·1, 1·8×1·7 ; *lobulus* ·8×·75, ·7×·5 ; *carina* ·8 ; c $\frac{1}{50}$; *br.* ♂ 8^{mm}.

Elata cæspitosa pallide flava flaccida. Caules 3–4-pollicares rubri, inferne nigrescentes, laxe pinnati et bipinnati.

Folia contigua vel subimbricata, basi sola pro more obtecta, a basi complicato-saccata, carinâ subrectâ angulum 45°–60° cum caule formante, in lobum magnum late semicordato-ovatum, auricula baseos caulem latissime transeunte, apice decurvo rotundatum, dilatata ; lobulus 2–3-plo brevior, rhombeus, ad insertionem caule alte incurrens, margine interno retusus vel obsolete 2–3-fidus, subplanus ; cellulæ parvæ æquilateræ leptodermes subpellucidæ.

Flores dioici : amenta ♂ tenuia julacea, ad ramos lateralia, folio collaterali subduplo longiora ; bracteæ 4-5-jugæ, foliis multo minores, equitantes, a basi supra medium in sacculum cylindricum erectum conflatæ, deinde bilobæ, lobis oblongis, antico patulo, postico breviore erecto. Antheridia binata magna globosa, filamento longiore tenui arcuato suffulta.

Lobulus foliorum rameorum semicordato-rhombeus, caulinorum sæpe apice magis protractus et linguæformis.

11. RADULA RAMULINA Tayl.

Hab. Lond. Journ. Bot. (1846) ; G. L. et N. Syn. Hep. p. 726. Andes Quitenses, regione sylvestri haud infrequens. M. *Tunguragua* et fl. *Pastasa*, in terra inter fruticulos lichenesque, vel ad fruticum ramos. *Baños*, in saxis umbrosis : pl. ♀ fertilis. M. *Cayambe*, et M.

Pichincha, ad ramos, a cl. JAMESON priusquam lecta. *Chuquiribamba* prope *Loja* (G. E. MASSEE).

F. lobus 3·0 × 2·3, *lobulus* 1·6 × 1·3, 2·0 × 1·4; *c* $\frac{1}{50}$; *f. ramulina* ·6–·4^{mm} *longa*; br. 1·4; *per* 4·5 × 1·6^{mm}; *caps* 2·25^{mm} *longa*.

Elata cæspitoso-stratificata pallide flava albicansve flaccida. Caules 3-pollicares crebre pinnati, interdum bipinnati, ramis ramulisque pro more brevissimis parvifoliis..

Folia subcontigua magna patentissima, basi brevi inserta, ultra dimidium biloba, complicata, utraque basi profunde cordata; carina subrecta angulo 60°–80° e caule extans; lobus oblique oblongus vel subobovatus—aliquando subrhomboideus—rotundatus, basi antica in auriculam falcato-semicircularem, caulem latissime transeuntem dilatatus, repandus; lobulus duplo (vel solum dimidio) minor, semicordato-rhombeus, obtusus subacutusve, auriculâ basali latissimâ caulem utrinque transeunte, medium versus apiculo lobulove auctâ, ad carinam sæpissime anguste alte inflatus, cæteroquin subappressus; cellulæ parvæ æquilateræ convexulæ leptodermes, annulo angusto opaco cinctæ.—Folia ramea caulinis 2–3-plo, ramulina 5–8-plo minora, imbricata, lobulo semicordato-quadrato magis inflato.

Flores dioici: ♀ in caule ramisque terminales, innovationibus duabus oppositis (raro una sola) suffulti. Bracteæ foliis caulinis duplo minores, perianthio appressæ, ad $\frac{1}{2}$ bifidæ, lobis oblongis, superiore rotundato, inferiore dimidio minore acuto.

Perianthia alte emersa, bracteas triplo superantia, *aurantiaca*, apice pallidiora, clavata vel clavato-poculæformia, compressa, ore truncato repandula. Calyptra magna = perianthii $\frac{2}{3}$, anguste pyriformis. Pedicellus perianthio vix duplo longior. Capsula perianthio duplo brevior, rubra, cylindrico-oblonga, ad basin usque 4-valvis; valvulæ siccando suberectæ, marginibus recurvis.

Andrœcia ramo ramulove constantia, julacea; bracteæ sub 6-jugæ, parvæ, dimidio inferiore cauli adnatæ et saccatæ, deinde bilobæ, lobo antico paulo majore falcato-oblongo rotundato, lobulo erecto.

Obs. Perianthia pro more pulchre aurantiaca, in stirpe Bañensi interdum virescentia, prælonga, inferne tenuiora; in Lojensi albida, latiora, elongato-campanulata fere appellanda.

12. RADULA VIRIDI-AUREA Spruce.

Hab. Andes Quitenses, ad pedem montis *Tunguragua*, juxta pagum *Baños*, in cortice.

F 1·7 × 1·5; *lobulus* ·6 × ·9; c $\frac{1}{40}$^{mm}.

Majuscula prostrata, viridi-aurea-flavicansve, tenera flaccida. Caules 3-pollicares laxe pinnulati, raro etiam vage divisi.

Folia confertiuscula, ad dimidiam latitudinem imbricata, sæpe margine gonidiis deformata, patulo-devexa, inferne complicata, carinâ plicâve fere horizontali (angulo axillari 80°) rectâ, medio tumidula; lobus oblique semicordato-ovato-rotundus, basi antica caulem transiens; lobulus lobo subtriplo brevior semicordato-rotundus, basi haud alte incurrens, caulem perpaulo transiens; cellulæ parvulæ æquilateræ leptodermes opacæ.

Flores invenire non potui.

A. *R. Xalapensi* Mont. et *R. subinflata* L. et G. facile distincta. *R.*

quadrata Gottsch. et *R. affinis* L. et G., quoad colorem et texturam nostræ sat similes, lobulo subquadrato distant.

13. RADULA INVOLVENS, Spruce.

Hab. Andes Quitenses, in sylva *Canelos*, ex arboribus pendula vel super *Plagiochilas* reptans.

F. 1·25 × ·9, *lobulus* ·4–·5 ; *c* $\frac{1}{50}$mm.

Elata flaccida rufo-badia. Caules tripollicares purpurascentes flexuosi laxepinnati, pinnis brevibus.

Folia subimbricata, a basi turgidâ (ad carinam arcuatam ascendente) falcato-divergentia; lobus oblique semicordato-ovato-oblongus rotundatus (sublinguæformis), basi caulem obvelans, dimidio supero valide involutus, margine angulato-repando, facie subpapulosa; lobulus triplo fere brevior trapezoideus, apice valde obtusangulus, sæpe bis implicatus, carinam versus alte mammillatus radicellasque in fascias duas divergentes colligatas proferens; cellulæ parvæ convexæ valde opacæ, trigonis autem magnis pellucidis ad cellularum angulos interpositis.

Cætera haud visa.

R. amazonicæ proxima, distincta tamen foliis ovato-linguæformibus involutis asperulis; lobulo haud æquilatero, ejus angulo apicali prælato.

Subtribus II. *PORELLEÆ.*

Platyphyllæ Nees. Hep. Eur. pro parte.

Plantæ elatæ speciosæ, virides, flavidæ badiæve, interdum politæ, cæspitoso-erectæ-pendulæve, vel procumbentes et stratificatæ. *Caules* e caudice repente radicelloso, in ætate dissoluto, oriundi, robusti, cellulis sub 12-stratis (24 c. in diametro) conflati, subarhizi, plumæformi-pinnati et bipinnati; rami omnes laterales, e folii axilla orti, basi tam lobo quam lobulo contigui iisdemque velati. *Folia* magna, alterna vel per paria approximata, incuba, basi fere transversâ inserta, complicato-bipartita, ad sinum nuda vel sæpe appendiculo deorsum spectante, integro vel fisso, aucta; lobus anticus major, patens, subovatus, apice lato integerrimus raro dentatus; lobulus subduplo brevior suberectus ligulatus (late linearis) integerrimus vel dentatus, basi externa in aliis speciebus in caule longe lateque decurrens, ibidemque profunde incisus et crispatus; cellulæ $\frac{1}{60}$–$\frac{1}{30}$mm, sæpius suboblongo-hexagonæ, ad angulos incrassatæ, inferiores interdum majores et discolores. *Foliola* ubique præsentia, lobulis subconformia, pro m. paulo latiora, apice integra, basi integra vel utrinque ad lobulorum instar in cristam decurrentia, unde caulis in tergo ad speciem alatus vel squamosus evadit. *Flores* omnium dioici: ♀ cladogeni, ramulo

perbrevi constantes. *Bracteæ* bijugæ, raro plures, bilobæ, foliis acutiores, margine semper ciliatæ denticulatæve; bracteola apice integra vel subbifida. *Perianthia* emersa subovalia, a fronte compressula, præter ad basin leptodermia, sectione trigona, carinulis autem utraque facie sæpe adjectis, ore primum subconstricto demum hiante sæpeque bilabiato, 10–20-laciniato. *Calyptra* plus duplo brevior, supera, globosa brevicolla carnosa (in *P. ptilopsi* basi 8–10c., superne 5c. crassa; in *P. platyphylla* inferne 4-, apicem versus 2-strata, cellulis minutissimis), basi pistillidiis sterilibus 7–30 circumdata, apice demum bivalvis. *Pedicellus* brevis, perianthio solum duplo longior, validus, cellulis alternis 12–20 in diametro, apice subdilatato interdum ad 24c. latus. *Capsula* magna rufula globosa, ad basin usque 4-valvis; valvulæ fissiles, demum pro more inæqualiter trilobæ, raro tota longitudine inter se disjunctæ, basi autem et paulo altius ad suturas integræ. Cellulæ exothecii sat magnæ et altæ, 4–8-gonæ, superiores tam latæ quam longæ, inferiores oblongæ (subrectangulares), omnes columnis validis rubrofuscis ad angulos fulcitæ. Endothecium tenue, facile (sæpe pedetentim) secedens, cellulis parvis, irregularibus, fibra pertenui inclusa obscure reticulatis vel plane vacuis, aliarum specierum 2–4-stratis, aliarum solum 1-stratis, conflatum. *Elateres* numerosissimi breviusculi tenues 2–3-spiri decidui. *Sporæ* magnæ, elateribus 3–5-plo latiores, subglobosæ, asperulæ. *Andræcia* brevispica julacea, ramum totum vel ejus apicem solum tenentia; *bracteæ* confertæ oppositæ, mediante bracteola cum contrariis connatæ, turgidæ, subinæquilobæ; *antheridia* constanter solitaria magna ovali-globosa stipitata.

V. PORELLA, Dill. Hist. Musc. (1741).

Lindberg, Utredning af Skadinaviens Porella-former (1869).

Madotheca Dum. Comm. bot. (1823); G. L. et N. Syn. Hep. (1844).

Genus ad diem unicum.

Hab. In sylvis montanis ad arborum truncos et ramos, necnon ad saxa, raro in terra inter fruticulos.

Distr. Inter tropicos magis abundant species; in zona temperata boreali haud infrequentes; ultra tropicum Capricorni autem multo rarius eveniunt. In Andibus species sub 8, cum pluribus varietatibus, legi; infra 600 metr. alt. autem et in tota planitie Amazonica nullam invenire potui.

Porella, placed by Nees and others in the same subdivision of the order as *Radulæ*, has really very few characters in common with it that are not shared also by several other genera. The only species of *Radula* that approaches it is *R. Gottscheana*, by the cladogenous ♀ flowers and the short capsule; while every other species is acranthous and has subcylindrical capsules three times as long as broad. *Porella*, however, differs from all *Radulæ* in the regularly pinnate and feather-like stems; the *axillary* branches (not infra-axillary, as in *Radula*, but intra-axillary); the universal presence of underleaves, the basal angles of which, like the external base of the lobules, are often decurrent on the stem in the shape of a laciniate and crispate wing; the side leaves (especially on the branches) often subopposite; the bracts of the ♂ spikes exactly opposite, and connate with the intervening underleaf; the toothed or ciliated ♀ bracts; the much shorter and usually less compressed perianth, at first constricted at the plurilaciniate mouth, and only becoming 2-lipped, or campanulate, by the extrusion of the fruit; the globose capsule, the valves of which are fissile, and in age unequally-lobed, but are rarely separate from each other down to the very base; the smaller, shorter elaters, and the comparatively much larger spores.

§ 1. *Per. facie anticâ* 2-, *posticâ depressâ* 1-*plicata*, *plicis carinisve sæpe* (*in ætate præcipue*) *obsoletis*, *ore brevissime fissa*, *lacinulis sub* 10, *triangularibus*, *denticulatis spinulosisve*, *demum hiantia bilabiata.*

1. *P. crispata.* Frons mediocris lineari-lanceolata, pinnata vel subbipinnata. F. conferta (ramea subopposita); lobo ovato-lingulato anguste rotundato, margine postico valde crispato basi parviauriculato, ad sinum 1–2-spino; lobulo ½ breviore lanceolato-ligulato; c. parvulis lævibus, inferioribus mediis subduplo longioribus flavidis. F^la lobulis majora, cordato-linguæformia integerrima, superne recurva. Per. ovato-oblonga obtuse 3-carinata (antice ecarinata) ore truncato ciliolata.
2. *P. asperifolia.* Caules sat elati, primum subdichotomi dein pinnati vel bipinnati. F. confertiuscula subfalcato-divergentia; lobo ovato-lingulato rotundato, margine postico recurvulo basi crispulo et breviter 1–2-spino; lobulo 2-plo breviore ligulato, basi antica breviter hastato, postica longe bidentato; c. parvulis convexis scaberulis. F^la lobulis 2-plo latiora ovato-linguæformia rotundata, basi subdecurrente 1–4-spina.
3. *P. ptilopsis.* Frons elata lanceolata bipinnata. F. magna subhorizontalia vix imbricata, per paria approximata; lobo ovato-oblongo truncato-rotundato, margine infero recurvo; lobulo vix 2-plo breviore ligulato, basi externa sagittato et runcinato-ciliato; c. mediocribus subpellucidis. F^la subduplo breviora, basi utrinque decurrente runcinato-fimbriata. Per. alte emersa, antice obtuse 2-plicata, postice late unicarinata, ore constricto minute spinuloso-denticulato, demum bilabiata.
4. *P. Müller.* Frons elata laxiuscule pinnata, pinnis longis. F. sat magna subdissita; lobo ovato-rhomboideo apiculato-acuto, apicem versus subdenticulato, basi integerrimo; lobulo subtriplo breviore ligulato basi in cristam decurrente; c. parvulis. F^la ligulata retusa, basi decurrente laciniato-cristata.
5. *P. squamulifera.* Frons elata arcte pinnata angusta, ramis brevibus decurvulis apice parvifoliis. F. sat magna arcte imbricata, lobo late cordato-ovato caulem antice late transeunte, apice rotundato

cucullato; lobulo haud duplo breviore obovato-ligulato basi in alam decurrente, ala in squamulas ovatas cucullatas fissa; c. valde incrassatis. F^{la} lobulis paulo latiora, basi hinc in alam lobulatam decurrentia. Per. late ovalia compressa, antice demum (carinulis 2 obliteratis) alte convexa, ore inæquilobulata et denticulata.

§ 2. *Per. superne saltem pluriplicata, demum campanulata, ore hiante* 10-, 15-*vel* 20-*fida, laciniis denticulatis ciliatisve.*

6. *P. acanthota.* Elata laxe inæqualiter bipinnata. F. subcontigua patentissima, in sicco immutata; lobo semiovato-oblongo, basi ad sinum in auriculam laciniatam producto; lobulo $\frac{1}{2}$ breviore anguste ligulato, basi externa longispino-auriculato; c. mediocribus suboblongis. F^{la} lobulis subæqualia, basi utrinque in cristam laciniatam decurrentia. Per. alte emersa obtuse pluriplicata, ore 15-fida, laciniis lato-subulatis acuminatis iterum lacinulatis.

7. *P. arborea.* Frons elata pinnata lineari-lanceolata, ramis brevibus apice tenui decurvulis. F. conferta patulo-devexa undulata; lobo semicordato-ovato obtuso, margine postico valde sinuato-crispo basi 2–4-laciniato; lobulo vix $\frac{1}{2}$ breviore ligulato, basi externa in processum liberum incisum protracto; c. parvulis, trigonis maximis. F^{la} lobulis duplo latiora, toto margine recurva, basi utrinque cristato-decurrentia. Per. superne 10-plicata, ad $\frac{1}{3}$ laciniata, laciniis 20, acuminatis ciliatis.

8. *P. brachiata.* A pr. differt foliis minus imbricatis, parum crispatis; lobo basi postica 1–2-ciliato; c. minutulis. F^{la} lobulis vix latiora, infra medium runcinato-ciliata, basi cristato-decurrentia, cristâ valde laciniatâ.

1. PORELLA CRISPATA.

Jungermania crispata Hook. Musc. Exot. t. 143.

Hab. Andes Granatenses, "in umbrosis montis *Quindiu*, ad radices *Quercus granatensis*" (*Humboldt* et *Bonpland*); ad Orchideas e Nova-Granata allatas carpsit cl. *Webster*, pl. ♂ et ♀ cum per.; in Andibus Peruvianis, ad rivuli *Marona-yacu* ripas, prope *Tarapoto*, ipse legi a. 1856.

F 1·7 × 1·2, *lobulus* 1·05 × ·35; f^{la} 1·2 × 1·2, 1·2 × 1·0, 1·0 × 0·8; *c. infer.* $\frac{1}{2}$/$_4$, *super.* $_4$/$_0$; *per.* 2·5–3·0 × 1·3^{mm}.

Fulva, stratificata, magn. *P. platyphyllæ.* Caules 2–4-pollicares, e caudice repente intricato-ramoso subfolioso assurgentes, pinnati vel subbipinnati, pinnis breviusculis subdissitis, frondem lineari-lanceolatam sistentes.

Folia conferta, caulina alterna, ramea subopposita, bipartita; lobus oblique ovato-lingulatus, apice angusto rotundatus, basi antica dilatatus (vix semicordatus) margine postico insigniter sinuato-crispus, basi in auriculam parvulam ovatam obtusam vel acuminatam productus; lobulus lobo dimidio brevior, plus triplo angustior, erectus, oblique lanceolato-ligulatus, repandus, basi interna (i.e. ad sinum) processo subulato hamato auctus; cellulæ parvulæ subopacæ, ad angulos subincrassatæ, nucleo in sicco collapso lineari-serpentino, inferiores mediæ autem duplo fere longiores, flavidæ.

Foliola lobulis sat majora cordato-linguæformia obtusata, supra medium recurvo-patula, margine laterali recurvo, caulina tam lata quam longa, ramea paulo angustiora.

Flores dioici: ♀ pinna abbreviata constantes. Bracteæ subbijugæ,

interiores foliis caulinis haud minores, iisdem latiores, inæqualiter ciliolatæ; bracteola biloba.

Perianthia emersa ovato-oblonga compressula obtuse tricarinata, ore truncato ciliolata.

Androecia brevispica, pinnam totam vel ejus apicem solum sistentia; bracteæ foliis breviores latioresque ventricosæ; bracteolæ magnæ subquadratæ, apice rotundato-truncato 4-crenatæ. Stirps Granatensis subminor est, arctius pinnata, foliorum lobo basi interna spinis sæpissime binis deorsum spectantibus armato, quasi bicaudato (neque, ac in planta Peruviana, simpliciter caudato).

Obs. Distinguished from the other crisped-leaved species by the leaves being nearly entire, and by the very broad underleaves, which are not decurrent and laciniate at the basal angles. Hooker's figure and description accord so well with my plant that I refer it confidently to his *Jung. crispata*. It is true that the figure shows the underleaves obcordate, and so they are, but in appearance only, from the reflexion of the obtuse apex. Humboldt gathered the original specimens in the Andes, a few degrees north of the equator; I mine a few degrees south; in both cases, no flowers were observed. Mr Webster, however, has picked specimens off Orchid bulbs, sent to Messrs Backhouse from the highlands of New Granada, and on them I find flowers of both sexes and perianths.

2. Porella asperifolia, Spruce.

Hab. ad arborum ramos secus rivulos prope *Turapoto* Andium Peruviæ orientalium, alt. 600m.

F. lobus 2·5 × 1·3, 2·1 × 1·2, *lobulus* 1·2 × ·35, *c* $\frac{1}{40}$; *fla* 1·1 × ·75; 1·0 × ·65mm.

Elata, 6–9-pollicaris, olivaceo-viridis flaccida pendula.

Caules vage vel subdichotome ramosi, ramis inæqualiter pinnatis.

Folia arctiuscule imbricata subfalcato-divergentia, in basi fere ipsa bipartita; lobus oblique ovato-lingulatus rotundatus, margine antico repandus basi obsolete denticulatus, postico recurvulo basi minute crispulus ac breviter 1–2-spinus; lobulus duplo brevior ligulatus obtusatus repandus, margine antico subdenticulatus basi breviter hastatus semicordatusve, postico basi longius producto subbidentatus; cellulæ parvulæ subæquilateræ concolores subopacæ papuloso-prominulæ et subverruculosæ.

Foliola lobulo vix æquilonga, duplo latiora, imbricata ovato-lingulata rotundata, basi subdecurrente dilatata utrinque 1–4-spina vel angulato-serrata, a basi ad medium usque caulem arcte amplexantia ibidemque laxe pellucide areolata.

Var. *flavens*, pellucida. Caules humiliores bipollicares laxe bipinnati. Folia breviora latiora. Foliola latiora sæpe ovato-triangularia retusula, infra medium utrinque valide 2–4-dentato-spinosa.—Cum typo habitat.

Madotheca divergens Ldng. et G. Syn. Hep. 731, Gottsche Mex. Leverm. 164, caule dichotomo-bipinnato nostræ subsimilis, differt foliis lævibus integerrimis, foliolis basi cordatis, etc.

3. Porella ptilopsis, Spruce.

Hab. in monte *Tunguragua*, ad saxa et truncos.

F. lobus 2·1 × 1·4, *lobulus* 1·2 × ·35, *c* $\frac{1}{35}$–$\frac{1}{30}$; *fla* 1·1 × ·55; *br* 1·3; *per* 3·5 × 2·1mm.

Elata pallide viridis stratificata; caules 5–6-pollicares laxiuscule pinnati, pinnis strictiusculis ascendentibus floribus pinnulatis, frondem lanceolatam sistentes.

Folia fere horizontalia, per paria approximata, parum imbricata, ad basin fere usque bipartita; lobus ovato-oblongus truncato-rotundatus repandus subangulatusve, margine infero toto plus minus recurvo; lobulus vix duplo brevior, ligulatus, plus triplo longior quam latus, rotundatus vel subretusus, basi semisagittatim productus ibidemque runcinato-ciliatus, cæterum integerrimus planus cauli appressus; cellulæ mediocres æquilateræ pellucidæ, ambitu anguste opacæ, folii marginem versus sensim subminores.

Foliola foliis duplo fere breviora, duplo longiora quam lata, appressa, ligulata, apice subrotundata subtruncatave, basi longe decurrente runcinato-fimbriata.

Flores dioici: ♀ ad ramos primarios, rarius in ipso caule, laterales. Bracteæ bijugæ, intimæ foliis plus dimidio breviores, paulo ultra ½ complicato-bilobæ; lobus rhomboideo-lanceolatus vel semiovatus apiculatus distanter ciliatus; lobulus duplo minor lanceolatus ligulatusve ciliatus; bracteola foliolis subæquimagna, paulo latior, ciliolata denticulatave.

Perianthia alte emersa, bracteas triplo fere excedentia, late ovalia compressa antice obtuse 2-plicata, postice late unicarinata, ore angusto minute spinuloso-denticulata demum bilabiata. Calyptra paulo minor, obovata opaca, bilabiatim rupta. Capsula magna globosa. Elateres torti bispiri, utrinque subobtusi, diametro sporis globosis sublævibus triplo angustiores.

Amenta ♂ ad ramos lateralia, folia duplo superantia, badia brevi-cylindrica julacea; bracteæ arcte imbricatæ, oppositæ, foliis multo minores complicato-concavæ bilobæ, lobulo lobo duplo minore, cum bracteola interposita, lobuloque bracteæ contrariæ, in labium trilobum connato.

Obs. Inter omnes Porellas Andinas pro perianthio microstomo insignis.

Var. MACROPTERA (*Porella macroptera* Mst.).

Cum *P. ptilopsi* sat convenit, differt autem fronde longiori (9-pollicari) angustiore, pinnis (tam pl. ♂ quam pl. ♀) floribus crebre pinnulatis. Folia minora, magis opaca, cellulis subminoribus, dimidio supero leniter recurvula, margine postico a paulo supra basin ad vel ultra medium valide incurva. Perianthia ovalia, sæpe facie anticâ alte convexa, quasi late unicarinata, alia (sulcâ mediâ interveniente) 2-carinata, facie posticâ autem semper concava, e mediâ concavitate prominula et 1-carinata, basi et paulo altius cellulis 3–2-stratis, deinde ad apicem 1-stratis, conflata, ore parvo brevissime lobulata, lobulis 10–20 angustis ciliato-spinulosis conniventibus; demum pro capsulæ emissione hinc vel utrinque hiantia. Calyptra perianthio ⅓ brevior, obovata, carnosa, basin angustam versus 8–10 cell. crassa, demum inæqualiter triloba, basi pistillidiis sterilibus sub 10 circumdata. Pedicellus breviter exsertus validus, cellulis 18–20 (sectione hexagonis) in diametro. Capsula subglobosa rufa, valvulis 4 inæquilatis, demum vario modo fissis, dehiscens; exothecium cellulis æqualibus oblongo-hexagonis (fere rectangularibus) sat crassis, ad angulos columnis flavo-fuscis fulcitis, cæterum leptodermibus, constans; endothecium flavidum tenue, facile secedens, cellulis 2–3-(margines valvularum versus sæpe solum 1-) stratis, majoribus, inæquilato-4-7-gonis leptodermibus conflatum, capsulæ

faciem internam (imo etiam ad pedicelli apicem) totam obtegens. Elateres sporæque iis *P. ptilopsidis* conformes.

4. PORELLA MÜLLERI (Gottsche).

Madotheca Mülleri Gottsch. Mex. Leverm. 153.

Hab. Andes Quitenses, in valle *Alausi*, loco *Lucmas*, alt. 2000^{m}, e ramis pendula, sterilis. Mexico, in monte vulcanico *Orizaba* (FR. MÜLLER).

F. lob 2·0 × 1·1, *lobulus* ·75 × ·3; *c.* $\frac{1}{40}$; *f^{ta}* ·85 × ·4 (*sine basi decurrente*).

Elata pallide viridis. Caules 5–6-pollicares pinnati; rami dissitiusculi elongati subæquilongi, raro iterum pinnulati.

Folia subdissita, ramorum contigua vel basi parum imbricantia, ad basin fere usque bipartita, ad sinum integerrima; lobus oblique ovato-rhomboideus, abrupte oblique apiculato-acutus, basi antica semicordatus, margine sinuato-repandus apicem versus subdenticulatus, margine postico infra medium recurvus sed non crispatus; lobulus triplo fere minor, obliquus, angulum 30° cum caule efformans, ligulatus vel ligulato-lanceolatus obtusatus, margine sinuatus, basi cristatim decurrens; cellulæ parvulæ rectangulari-hexagonæ subopacæ, ad angulos parum incrassatæ, basales majores flavidæ. Folia siccando margine postico valide convoluta.

Foliola subimbricata ligulata retusa, basi in cristam plus minus laciniatam longe decurrentia; alia media basi radicellifera.

A *P. ptilopsi* differt ramis distantibus subsimplicibus, foliis apiculatis subdenticulatis, lobulis brevioribus subdivergentibus, etc.—*Mad. Chilensis* L. et Ldbg. distare videtur caule humiliore vage pinnato; foliis arcte imbricatis integerrimis; foliolis haud basi cristato-decurrentibus.—*M. Mülleri* G. autem, Mexicana, ad amussim fere cum nostra Andina congruit.

5. PORELLA SQUAMULIFERA, Tayl.

Madotheca squamulifera Tayl. in Lond. Jour. Bot. 1846.

Hab. Andes Quitenses, prope *Esmeraldas*, ex arboribus pendula (W. JAMESON); in valle *Pangor*, ad rupes, alt. 2600^{m} (R. S. 1858).

F. lobus 2·0 × 1·9, 1·8 × 1·4, *lobulus* 1·3 × ·7; *f^{ta}* 1·3 × ·8; *c. inferiores* $\frac{1}{30}$, *submarginales* $\frac{1}{30}$–$\frac{1}{60}$; squamulæ ·2^{mm}.

Elata, dense cæspitoso-stratificata badia, apice virescens. Caules e caudice repente 6–9-pollicares validi crebre pinnati arhizi; rami breves, a medio caule superne sensim decrescentes, arcuato-decurvuli, apice attenuati, siccando julacei, simplices vel ramulo unico paucisve pinnulati.

Folia arcte imbricata, convexa, ad basin fere usque bipartita; lobus late cordato-ovatus-ovalisve, antice caulem late transiens, e margine postico apiceque (rotundato) valde incurvis cucullatus, repandulus, raro hic illic denticulo armatus; lobulus haud duplo brevior obovato-ligulatus rotundatus, suberectus, margine recurvulo, basi in caule longe decurrens ibidemque in squamulas subimbricatas ovatas amorphasve, integras bifidasve, cucullatas fissus; cellulæ inferiores majores flavidæ pellucidæ suboblongæ, plures apicem marginemque versus duplo fere minores, subæquilateræ, opacæ, pariete omnium ad angulos valde incrassato.

Foliola lobulis æquilonga, paulo latiora, imbricata, subappressa, ligulato-

oblonga, margine toto recurvo integerrima nisi basi hinc decurrente in lobulos squamulasve fissa.

Flores dioici: ♀ ad caulem (raro ad ramos) laterales. Bracteæ subbijugæ raro plures, intimæ foliis æquimagnæ ad $\frac{1}{2}$ complicato-bilobæ, lobo semiovali, lobuloque angustiore, æquilongo fere, subdenticulatæ; bracteola æquilonga late ovalis, apice truncatulo præcipue denticulata.

Perianthia foliis sat longiora, late ovalia, compressa, antice bi-postice uni-carinata, fructu maturando facie anticâ alte convexa (carinis obliteratis), posticâ concava, medio tamen in carinam obtusam elevata, ore inæqualiter lobulato denticulatoque, demum bilabiata et decurva.

Exemplaria originalia Jamesoniana cum meis satis bene conveniunt. Folia margine postico valde incurva, basi ipsa tamen vel plana vel crispula. Lobuli foliolaque basi in alam profunde laciniatam super caulem producta, laciniis squamulas mentientibus. Caulis aliter non est "squamulifera," neque in hac specie nec in *P. arborea* cæterisque.

6. PORELLA ACANTHOTA, Spruce.

Hab. in monte *Azuáy* Andium Quitensium, ad fruticum ramulos.

F. lobus 2·0 × 1·4, *lobulus* 1·4 × ·35; *c* $\frac{1}{30}$; *f*^{la} 1·1 (1·8 *ad basin decurrentem usque*) × ·8; *br* 2·5; *br*^{la} 2·3 × 1·1; *per* 4·0 × 2·1, *laciniæ* 1·5; *elateres* $\frac{1}{4}$; sporæ $\frac{1}{24}$—$\frac{1}{20}$ mm.

Elata pendula virescens. Caules 6–9-pollicares, laxe bipinnati, ramis ramulisque subinæquilongis, apice sæpe attenuatis.

Folia subcontigua, angulo fere recto patula, siccando immutata, bipartita complicata, carinâ perbrevi arcuatâ; lobus semiovato-oblongus, margine supero, basi subsemicordata obsolete denticulata excepta, fere recto, postico apiceque plus minus rotundato repando, basi (*i.e.* in sinu) in auriculam 2–5-laciniato-spinulosam protractus; lobulus lobo $\frac{1}{2}$ brevior appressus ligulatus (4plo longior quam latus) rotundatus, basi externa in auriculam longam spinoso-fimbriatam productus; cellulæ mediocres parum elongatæ opacæ, trigonis magnis ad angulos auctæ, subbasales sensim majores flavidæ.

Foliola lobulis subæquimagna, subimbricata, ligulato-oblonga rotundata, basi (hinc præcipue) in cristam laciniatam longe decurrentia, laciniis triangularibus acuminatis.

Flores dioici: ♀ laterales. Bracteæ bijugæ, intimæ folia subexcedentes profunde bifidæ, complicatæ, obtusæ, plus minus denticulato-ciliatæ, lobo semiovali, lobulo ligulato fere æquilongo triplo angustiore; bracteola ovato-lanceolata sublingulata rotundata ciliolata.

Perianthia alte emersa, f. caulinis duplo longiora, ovalia compressa, obtuse subplicata, ore truncato subconstricta, demum campanulata et macrostoma, 15-fida; laciniis lato-subulatis acuminatis iterum lacinulatis denticulatisve, longit. = $\frac{2}{3}$ perianthii. Calyptra perianthio duplo brevior globosa valida opaca, cellulis minutissimis 5-stratis conformibus conflata, demum bivalvis. Capsula magna globosa, e perianthio in pedicello perbrevi valido vix emersa, vix ad basin usque 4-partita; valvulæ fragiles, demum in lacinias 3 inæquales longitudinaliter fissæ. Cellulæ bistratæ, exteriores sat crassæ, apicem valvulæ versus tam latæ quam longæ, infra medium autem plus minus elongatæ, omnes leptodermes nisi ad angulos ubi columnis rubro-fuscis fulcitæ; stratum interius facile (sæpe pedetentim)

secedens, tenerum, cellulis irregularibus, fibra pertenui inclusa obscure reticulatis, constans. Elateres parvuli tenues 2–3-spiri. Sporæ magnæ, elateribus 4–5plo latiores subglobosæ setulis minutissimis asperulæ.

Caulis in hac specie compressulus est; cellulæ parvæ sub 12-stratæ (24 in sectionis diametro), stratorum 4 vel 5 extimorum ad Palmarum instar opacæ, rufo-badiæ vel nigrescentes, pachydermes, sectione subelongatæ; internæ pallidæ leptodermes, sectione subæquilateræ.

Madotheca Brasiliensis Raddi, subaffinis, caules habet simpliciter pinnatos, folia late semicordato-ovata, auriculâ interlobulari galeatâ subsaccatâve, lobulo subspinuloso; foliola ovato-linguæformia spinulosa (basi ac in nostra decurrentia et laciniata); bracteas laciniato-spinosas.

7. PORELLA ARBOREA (Tayl.).

Madotheca arborea Tayl.! in Lond. Journ. Bot. 1846.

Hab. in sylvis Andium Quitensium, alt. 1500–3000^{m}, ad latera montium *Tunguragua* et *Pichincha* præcipue, ubi ad arborum ramulos pulchre viget.

F. lobus 2·2 × 1·6, *lobulus* 1·6 × ·4; *c* $\frac{1}{40}$—$\frac{1}{35}$; f^{la} (*basi decurrente exclusa*) 1·5 × ·75; *per* 2·0 × 2·0, 2·0 × 2·5, 3·0 × ·25^{mm}.

Elata fulva rufescensve. Caudex principio adest, prostratus, brevis, subramosus, e foliis caducis cito denudatus, radicellis brevibus foliolorum reliquiis adnatis in matrice repens; fragilis est denique dissolutus, primum autem caules suberectos pendulosve profert. Caules 6–8^{cm} longi validi rufo-badii pinnati, frondem lineari-lanceolatam sistentes; rami breves ($\frac{1}{2}$–1^{cm}) raro iterum subpinnulati, apice sensim attenuati decurvulique.

Folia subopposita dense imbricata patula subdevexa undulata, ad basin fere usque bipartita; lobus oblique semicordato-ovatus sensim angustatus obtusus repandus, subundulatus, toto margine postico valde sinuato-crispus (sinubus sub 5), basi laciniis 2–4 subulato-acuminatis deorsum spectantibus auctus; lobulus vix dimidio brevior ligulatus subfalcatus obtusatus, basi interna subspinosus, externa in processum obtuse incisum vel ciliatum productus; cellulæ parvulæ pellucidæ suboblongæ, trigonis angularibus maximis, basin versus submajores flavidæ.

Foliola imbricata suberecta, lobulis subæquilonga, duplo fere latiora, late ligulata rotundata, toto margine recurva, utraque basi in cristulam sinuato-lobulatam super caulem decurrentia.

Flores dioici: ♀ in ramo brevi vel haud raro subelongato terminales. Bractæ foliis subæquales, magis acutæ, lobulo longiore toto margine—lobo solum margine postico (interno)—dentato-ciliato-spinosove; bracteola ovato-ligulata, emarginato-bifida, margine plano recurvulove ciliata.

Perianthia late ovalia ore subconstricta, demum (supramatura) ex ore hiante compresso-campanulata, superne 10-plicata, apice ad $\frac{1}{5}$ laciniata, laciniis 20 (sc. 10, bipartitis) tenui-acuminatis ciliatis. Capsula majuscula globosa badia bistrata; cellulæ inanes, exteriores sectione transverse rectangulares, pariete valde incrassato, interiores minores teneres secedentes. Elateres elongati arcte bispiri obtusissimi diu persistentes. Sporæ magnæ ovali-globosæ minute tuberculosæ.

Amenta ♂ ad caulem et ramos primarios lateralia, folium caulinum

proximum plus minus excedentia, ovato-cylindracea, julacea; bracteæ *oppositæ*, foliis breviores latioresque, arctissime imbricatæ, basi antica semicordata pro brevi spatio cum contraria connatæ, ultra ½ bilobæ, lobulis posticis mediante foliolo conformi in laminam apice trifidam recurvam alte connatæ; antheridia solitaria (cujusque sacculi bina) maxima ovali-globosa.

Var. *megaloura* S. Robusta; caules 10^{cm} et ultra alti, sæpe bipinnati. Folia magna valde crispata, solum obtusa vel etiam subacuta, ad sinum insigniter spinoso-appendiculata, lobulo utraque basi inciso. Foliola latiora, sæpe rotundo-oblonga, basi decurrente magis laciniato-crispa.—*Hab.* secus fl. *Pastasa*, ad cataractam *Agoyan* in rupibus, ad *Rio Blanco* ostia in ramis; etiam in m. *Tunguragua* ad terram inter *Vaccinia* lichenesque.

Var. *oreopteris* S. Robusta, elata—fere pedalis. Foliorum lobus margine postico a basi ad ½ recurvo, parum vel non crispulus. Bracteæ longiciliatæ.—*Hab.* in monte *Pichincha* ad ramos (W. JAMESON et R. S.); quoque in m. *Azuay* a cl. JAMESON lecta fuit.

Obs. In all the forms of this variable species the perianth is normally 10-plicate, but the plicæ are often irregular and inconstant in number; the medial postical fold is however always the most prominent, showing the primitively trigonous form of the perianth.—I have taken as the type of the species the form which is most frequently fertile throughout the Quitenian Andes. Jameson's original specimens are larger and often sterile, but shew no structural difference besides the leaves being less crispate. Mitten, on the faith of a specimen in Taylor's herbarium named *Mad. subciliata* L. et L., has referred it to that species, from which it differs essentially in the underleaves having a caudate and laciniate prolongation at each basal angle, whereas those of *M. subciliata* are said to be "integerrima vel subdenticulata." I cannot help suspecting some oversight in the description of *M. subciliata* (which was founded on a specimen of Jameson's); for neither by Jameson nor myself has any *Porella* been gathered which has the leaf-lobule laciniato-caudate, yet lacks a similar appendage to the underleaf.

8. PORELLA BRACHIATA (Tayl.).

Madotheca brachiata Tayl.! in Musc. Jamesonianis exsicc.

Hab. Andes Quitenses, ubi legit W. JAMESON (a meipso nusquam in vivo visa).

Habitu et statura *M. arborea* J. congruit, differre videtur caracteribus sequentibus.

Folia solum subimbricata semicordato-oblonga-ovatave, apice rotundata decurva, margine postico inferiore subcrispa, cæterum plana, basi posticâ breviter 1–2-ciliata, anticâ subunidentata—raro (quoad lobum majorem) omnino inermia; lobulus lato-ligulatus oblique rotundatus *valde crispatus*, basi internâ laciniis 1 vel 2, raro pluribus, elongatis sagittatus hastatusve, externâ in appendiculum ciliis devexis fimbriatum dilatatus; cellulæ firmæ guttulatæ *minutulæ* ($\frac{1}{60}$—$\frac{1}{50}$ mm) valde incrassatæ, marginales lobulorum et foliolorum magis opacæ et crassiores.

Foliola lobulis breviora, vix latiora, ovato-ligulata subrotundata, infra medium runcinato-ciliata, aliquando subhastata, basi in ala valde laciniata super caulem longe decurrentia.

Cætera non habui. A *P. arborea* ægre separanda.

Subtribus III.—*PTILIDIEÆ.*

Ptilidia Nees. Hep. Eur. I. 95; III. 99 (1833). *Blepharozieæ* Lindberg Hep. in Hibernia lect. (1875).

Plantæ pro more elatæ, solum in *Chætocolea* pusillæ, cæspitosæ, erectæ, depressæ pendulæve; raro virentes, plerumque rufo-badiæ flavidæve, aliæ roseæ sanguineæve. *Caules* validi, utplurimum e caudice repente, demum dissoluto, interdum flagellifero orti, vagi vel pinnati, interdum paraphylliis squamulosi; rami in plurimis omnes laterales, in paucis etiam postici. *Radicellæ* vix ullæ nisi ad caudicem et flagella. *Folia* alterna, raro subopposita, in plerisque incuba vel transversa, in paucis succuba, plerumque magna, sat longa, 2-vel 4-fida, in aliis multipartita, semper fere (basi saltem) dentata vel ciliata, segmentis interdum capillaceo-ramosis, subconcava vel canaliculata, in *Mastigophora* autem et *Lepidolæna* distincte complicata; in hac laciniæ tam lobulorum quam foliolorum saccatæ (ad *Frullaniæ* instar) sæpe inveniuntur. *Cellulæ* mediocres vel fere magnæ, raro parvæ, semper fere longiores quam latæ, minute scabræ verruculosæve. *Foliola* foliis subconformia, magis symmetrica tamen, æquimagna vel parum minora. *Flores* utriusque sexus vel in caule vel in ramis lateralibus (nunquam in posticis) terminales, omnium specierum (*Anthelia* unica paroica excepta) dioici. *Bracteæ* ♀ semper fere plurijugæ, foliis magis fissæ armatæque, pro m. inter se subliberæ foliisque sensim majores, intimæ autem aliarum specierum parvæ perianthio adnatæ. *Pistillidia* plura (16–60). *Perianthia* vel omnino nulla, vel cum bracteis intimis vestita et confusa, vel denique perfecte distincta et libera, subteretia vel plicato-carinata, carinis 3–10: quando rarissime ad 3 solis redactis, carina tertia postica. *Calyptra* pro m. parva, aut libera et pistillidiis sterilibus basi (vel sæpe altius) obsita, aut involucro adhæsa, apice ipso pistillidiifera. *Capsula* in pedicello breviusculo, raro elongato, vel subglobosa et rectivalvis, vel cylindracea et tortivalvis, valvulis haud raro fissis; 2–8-strata, strato intimo fibris semiannularibus persæpe notato. *Elateres* tenues bispiri, cito decidui, vel pauci basales longius persistentes. *Sporæ* minutæ globosæ. *Andræcia* terminalia brevispica; *bracteæ* 1–3-andræ.

This subtribe is only imperfectly represented by the genera and species of tropical America, the typical European genus, *Ptilidium*,* being

* *Ptilidium* Nees. Hep. Eur. I. (1833) = *Blepharozia* Dum. Recueil (1835: previously proposed by Dumortier merely as a subgenus of *Jungermania*).

entirely wanting there; while the curious and elegant *Lepidolana*—so wonderfully "mimicking" *Frullania* in its vegetative organs, but with a totally different fructification—does not begin to appear until some way beyond the southern tropic, and has its headquarters in the cooler parts of the south temperate zone. There can be no doubt of the close relationship of the plants I have combined in this group, their most obvious character being the equably tristichous, cloven leaves, whereof the postical are nearly, or quite, as large as the lateral, and are never absent in any species. The polyphyllous ♀ involucres, always borne either on the apex of the stem or of a side-branch—never on a postical branch, although such branches exist in at least two genera—afford another good and very nearly constant character. For in the next subtribe (*Trigonantheæ*) a postical inflorescence prevails through the great majority of the genera and species, even in cases where the leafy branches are all lateral, as they are in many *Lepidoziæ*.

Characters, often esteemed of the greatest weight, break down when applied to this group. Thus *Trichocolea*, whose involucre, perianth, and calyptra are soldered into a long scaly cup, of which the constituent envelopes can rarely be discriminated except by careful dissection, is so exactly like *Leiomitra* in its vegetative organs, that without fruit the two genera are undistinguishable. Yet in the latter the calyptra is quite free from the involucre, and there is no monophyllous perianth at all. It is possible that too much importance has been assigned to adhesions of the floral organs, thereby obscuring our perception of what are really more obvious and important affinities. Nor are the adhesions so invariable as has been assumed; for the calyptra of *Trichocolea* is sometimes free, or at least easily separable, from the involucre.*

Again, *Chandonanthus squarrosus* and *hirtellus* (cf. Hooker, Musc. Exot. t. 78 and 79, under *Jungermania*) are so like *Lepicolea pruinosa* Tayl. (to be described below) in habit, in the scaly stems, and the deeply cloven, ciliated leaves (although the leaves are only once bifid in the former genus and twice bifid in the latter) that, in a natural arrangement, they must stand in the same group; yet the leaves in *Lepicolea* are incubous, in *Chandonanthus* decidedly succubous. The pluriplicate perianths in the latter genus, added to other points of resemblance, plainly show its affinity to *Anthelia;* in which, however, the leaves are transverse!

Lepicolea pruinosa on another hand resembles our *Mastigophora Woodsii* in habit, colour, and in the way the leaves are cloven and ciliated, so that they might well be supposed congeners. The fruit and perianth of both species are hitherto unknown, and if *M. Woodsii* should one day be found to possess an adherent involucre, it will have to be placed in *Lepicolea*. But if the perianth prove distinct from the involucre, I hardly see how the species can be kept apart from *Ptilidium* (= *Blepharozia* Dum.) where indeed it was placed by Dumortier. The *Mastigophoræ* of which the perianth and fruit are known, have all only lateral (no postical) branches, on some of which the ♀ flowers are borne; and such branches are not always shortened down to flowers alone, but have often several normal leaves below the bracts (*e.g.* in *M. diclados*): being, in fact, no shorter than the floriferous branches are sometimes seen in *Ptilidium ciliare*, so that it becomes difficult to assign any really valid distinction between *Ptilidium* and *Mastigophora*.

* Cf. Carrington on *Trich. Tomentella* in Hep. Brit., p. 40.

CONSPECTUS GENERUM.

§ 1. *Folia vel incuba vel transversa. Fl.* ♂ 2- (*raro* 1–3-) *andri.*

6. ISOTACHIS.—Elatiuscula, persæpe apice rubescens vel tota sanguinea, parum ramosa, aliis ramis posticis aliis lateralibus. Folia et foliola transversa decurvula canaliculato-concava bi-raro tri-loba, lobis pro m. brevibus evittatis, margine (basi saltem) dentato ciliatove. Bracteæ (nisi in *I. ripensi*) plurijugæ, intimæ in aliis speciebus minutæ ex p. perianthio adnatæ. Perianthia vel elongata teretia carnosa minute squamulosa, vel (in subg. *Sendtnerella*) breviora 3–5-carinata subleptodermia nuda. Capsula cylindracea bistrata, valvulis spiraliter tortis integris.

7. HERBERTA.—Elata rufo-badia paulo ramosa, ramis posticis, innovationibus subfloralibus interdum lateralibus. Folia subincuba hamato-secunda angusta, multo longiora quam lata, basi interdum ciliata cæterum integerrima, profunde biloba, lobis angustis acuminatis vittatis. Bracteæ plurijugæ liberæ equitantes, ciliatæ spinosæve, insigniter bisulcæ. Perianthia ad apicem fere usque bracteis velata, peranguste ovato-subulata 3-carinata, carinis latis sulca exaratis, ore 6-fida. Capsula globosa 5–8-strata, valvulis rectis 2–6-fidis. Elateres basales cæteris longius persistentes.

8. LEPICOLEA.—Elata sæpius flavida, pinnata, caule interdum ramentaceo; rami omnes laterales, apice frequenter attenuati. Folia incuba planiuscula, plerumque pulchre ciliata, profunde bis bifida, segmentis angustis evittatis, apice sæpe capillaceis. Bracteæ plurijugæ parvæ, interiores perianthio adnatæ. Perianthia campanulata bractearum apicibus liberis ramentacea. Capsula subglobosa 5-strata. Elateres basales cæteris longius persistentes.

§ 2. *Folia succuba. Flores* ♂ 1-*andri.*

9. CHÆTOCOLEA.—Pusilla, facie *Cephaloziæ*, radicellosa, vage ramosa, aliis ramis posticis, aliis lateralibus. Folia palmatifida integerrima. Flores ♀ in caule innovando terminales. Bracteæ exteriores ciliato-multifidæ; interiores perianthio cupulato, ore longiciliato, adnatæ, apicibus setaceis solis liberis. Calyptra . . . ?

10. LEIOMITRA.—Elata, pinnatim ramosa, e foliis capillaceo-multifidis-ramosisque ad speciem lanata. Flores ♀ terminales, innovatione nulla suffulti. Bracteæ liberæ, intimæ foliis triplo majores, primum 10–12-fidæ, dein capillaceo-ramosæ. Perianthium omnino nullum. Calyptra ovali-globosa, ab involucro discreta, dimidio inferiore carnosa et pistillidiis sterilibus onusta. Capsula magna subglobosa 2–6-strata.

VI. ISOTACHIS, Mitt.

In Hook. Antarct. Voy. II. 148; Gottsche Mex. Leverm. 104.

Plantæ cæspitosæ, plus minus elatæ, tenellæ tamen, pallide virides, apice rubescentes, interdum totæ roseæ vel etiam sanguineæ. *Caudex* prostratus rudimentarie foliosus, interdum flagellifer, caules assurgentes simplices vel paucirameos proferens. *Rami* foliis posticis axillares; innovationes autem subflorales persæpe laterales. *Radicellæ*, albidæ vel rubræ, solum ad caudicem et flagella adsunt.

Folia majuscula, sat arcte imbricata, transversa, parum incuba, plus minus decurvo-secunda, late oblonga ovatave subcomplicato-concava (melius canaliculata), apice sinu brevi lunulari—raro profundiore et acuto—emarginata, rarissime triloba, apicibus acutis vel altero obtuso, margine persæpe argute dentata ciliatave; *cellulæ* mediocres majusculæve, subincrassatæ, omnes fere sublongiores quam latæ, oblongo-quadratæ hexagonæve, mediæ cæteris subconformes, nec ad *Herbertæ* instar vittam sistentes.

Foliola foliis subconformia, plerumque parum minora, exacte transversa et symmetrica. *Flores* dioici; ♀ terminales. *Bracteæ* in plerisque plurijugæ, inter se liberæ (in unica specie connatæ), foliis submajores, subconformes, nisi magis profunde 2–3-lobæ incisæque. —Intra involucrum in aliis speciebus adveniunt bracteæ plurimæ minutæ (sive paraphyllia) quæ posterius cum perianthio tolluntur, eidemque adnatæ apice solo prominent. Horum paraphylliorum 2 vel 3 extima, tenera biloba integrave, interdum libera restant, bracteis propriis celata.—*Pistillidia* ad 16. *Perianthia* in plurimis elongata et angusta, conica, cylindracea, fusiformiave, carnosa, cellulis 3–6 crassa, extus paraphylliorum apicibus liberis scabra, teretia vel apice solo trigona, demum subtrifida; in aliis autem breviora latioraque, tenuia vel parum carnosa, lævissima, a medio (saltem) 3–5-carinata, ore plurifida. *Calyptra* brevis, tenuis vel carnosula, dimidio inferiore pistillidiis sterilibus stipata. *Capsula* in pedicello breviusculo, 8-cell. in diametro, basi calceolo ciliato infixo, exserta, majuscula, cylindracea, 2–3-plo longior quam lata, bistrata, ab ipsa basi 4-valvis, *valvulis* in spiram unicam completam *contortis;* cellulæ exteriores tesselatæ vacuæ, interiores fibra spirali (ex p. deficiente) farctæ. *Elateres* bispiri. *Sporæ* læves. *Andræcia* in *I. ancipite* sec. cl. Gottsche ramulo tenui, bracteis monandris constantia; in *I. erythrorhiza* autem inveni spicam ♂ terminalem, bracteis foliis conformibus 2-(raro 1-vel 3-) andris.

Subgenus 1. ISOTACHIS. Perianthium elongatum pluri-(5–6-) stratum scabridum, teres, apice solo trigonum demum trifidum. Folia apice pro m. solum emarginata.

Subgenus 2. SENDTNERELLA S. Per. brevius, ovoideum, 3-5-carinatum, cellulis unistratis, in altera specie 2–3-stratis, conflatum, lævissimum.

Hab. Terrestris et rupestris, in locis humidis montium.

Distr. America, a Mexico et insulis Antillanis per Andium juga ad Caput Horn usque; necnon in Nova Zelandia. Species typicæ 2 vel 3 in Andibus Granatensibus legit LINDIG. *I. serrulatæ* (Sw.), stirpis e colore ruberrimo et foliis eleganter dentatis insignis, necnon *I. erythrorhizæ* L. L., exemplaria fertilia legerunt HUSNOT aliique in insulis Guadalupa, Sti. Vincentii, &c. Ipse autem nullam, nisi subgeneris *Sendtnerellæ* speciem

solitariam in Andibus Quitensibus inveni. *I.* (*Sendtnerella*) *ripensis* n. sp. perianthium habet latum, tota fere longitudine obtuse 5-carinatum, ore profunde 10-fidum, laciniis lanceolatis denticulatis ; folia foliolaque, idem ac in nonnullis *Herbertis*, *basi* spinosa. *I.* (*Sendtnerella*) *erythrorhiza* L. et L. medium fere tenet inter *Isotachin* et *Sendtnerellam*, perianthio inferne 3–2-cell. crasso, epapilloso autem, dimidio supero obtuse 3–4-plicato; foliolis medio margine utrinque grandidentatis, quasi 4-lobulatis. Cum *Isotachi* congruit capsula torta, dum capsula *I. ripensis* ignota adhuc remanet.

Herberta Gray (=*Sendtnera* Nees.) *Sendtnerellæ* habitu et foliis tristichis subsimilis, pro m. longe robustior est, colore badio ; foliis prælongis uncinatis, profunde bifidis, cellulis medianis linearibus vittatis ; perianthiis alte trigonis (carinis latis unisulcis) apice longe subulatis; capsulæ valvulis *rectis* bi-plurilobis.—*Pleuroclada* nob. et *Anthelia* Dum. genera *Isotachi* e longinquo affinia sunt.

ISOTACHIS (SENDTNERELLA) RIPENSIS, Spruce.

Hab. Andes Quitenses, ad rivulorum ripas montis *Pichincha*.

F 1·65 × 1·15 ; *c* $\frac{1}{32}$–$\frac{1}{28}$; *f*^{ma} 1·15 × 0·9 ; per 2.5^{mm}.

Cæspitosa tenera e pallide viridi rufescens. Caudex brevis tenuis prostratus repensve ramosus, foliis rudimentariis et radicellis vestitus, flagella postica radicantia et caules assurgenti-erectos proferens. Caules steriles elongati, feminei breves, $\frac{1}{4}$–$\frac{1}{2}$-pollicis longi, infra perianthium terminale innovationes $\frac{1}{2}$–1-pollicares solitarias binasve laterales proferentes, cæterum vel simplices vel ipsa basi subramosi ; ramis foliosis lateralibus, flagellaribus (paucis) posticis microphyllis radicelliferis ; præterea arhizi.

Folia caulina arcte imbricata, innovationum dissitiuscula, subincuba (lineâ transversali, vel antice subincurrente, cauli inserta) devexo-secunda, complicato-concava, basi turgida, inæquilateri-cordato-ovata, ad $\frac{1}{3}$ usque bi- (raro tri-) fida ; lobis subæqualibus sinubusque acutis, raro obtusis ; basi antica integerrima, postica 1–3-spina ; cellulæ mediocres subconformes, oblongo-quadratove-hexagonæ convexulæ leptodermes, nisi ad angulos leniter incrassatæ, endochromio parco pro parte in annulum tenuem opacum congesto.

Foliola paulo breviora, transversa, fere squarroso-recurva, oblonga bifida, basi utrinque 1–3-spina.

Flores dioici : ♀ terminales, innovatione suffulti. Bracteæ 1-jugæ, foliis submajores, ad $\frac{1}{3}$ bi-trifidæ, plerumque serrulatæ, cum bracteola conformi sæpissime altiuscule connatæ. Pistillidia sub 16.

Perianthia (juniora) subemersa, ovoidea, obtuse 5-plicata, tenuia unistrata lævissima, ore constricto profunde 10-fida, laciniis longe lanceolatis 7–10-denticulatis, e margine recurvo canaliculatis.*

Obs. The innovations uniformly spring from the axils of the side leaves next below the bracts ; but the rooting flagella are axillary to the underleaves. The perianths consist of but one layer of cells, and there are no adnate scales or bracteoles on any part of them.

* Forsan ad *Sendtnerellam* pertineat quoque *Sendtnera ? trifida* Gottsch. Hep. Novo-Granat., sterilis solum adhuc nota, cui adsunt folia omnia trifida, margine postico 3-pluridentato; foliola triplo minora trifida, utrinque pluridentata.

VII. HERBERTA, Gray.

Nat. Arr. Brit. pl. (1821). *Schisma* Dum. Comm. Bot. (1823). *Sendtnera* Nees. in Syn. Hep. (1845).

Plantæ proceriores, cæspitosæ, colore rufo-badio insignes, apice novello interdum flavidæ, in *H. pensili* albidæ, caudice repente flagellisque radicelliferæ, cæterum arhizæ. *Caules* 3–9-pollicares, validi opaci, parum ramosi, assurgentes vel persæpe penduli, ramique apice persæpe hamati. *Rami* postici, sc. ex angulo folioli orti; adveniunt interdum sub flore ♀ sterili innovationes duæ laterales, oppositæ, unde caulis furcatus evadit; magis frequenter autem innovationes solitariæ et posticæ sunt.

Folia incuba vel fere transversa, magna, angusta, 2–4-plo longiora quam lata, tristicha:—postica, lateralibus conformia, vix minora—decurva et plus minus hamato-secunda, canaliculato-concava (vix subcomplicata), basi in aliis speciebus ciliata, ab apice ad $\frac{1}{2}$–$\frac{3}{4}$ acute biloba, lobis cruribusve paululum divergentibus, sensim et longe acuminatis subintegerrimis, postico subangustiore; e cellulis mediis elongatis discoloribus vittata, vitta basi vel altius bifurca, furcis in crurium apice desinentibus. *Cellulæ* parvæ pachydermes scaberulæ subrhomboideæ; vittæ autem triplo longiores, lineares et (infimæ saltem) e fibra spirali inclusa plurisinuatæ.

Flores dioici: ♀ terminales, capitati, innovatione (raro 2 vel 3) suffulti. *Bracteæ* plurijugæ, densissime equitantes, perianthium arcte amplexantes, tota longitudine tamen liberæ, foliis dimidio vel duplo fere longiores, brevius tamen bilobæ, ab ipsa basi profunde bisulcæ et inter sulcas in carinam altam prominulæ, margine, interdum ad apicem tenuem usque, ciliatæ spinosæve. *Pistillidia* plura, ad 24, sterilia ad calyptræ basin persistentia. *Perianthia* apice solo emersa, angusta, 3–5-plo longiora quam lata, ovato-subulata vel anguste fusiformia, trigona, carinis sulca exaratis exindeque perianthia apicem constrictum versus 6-plicata videntur, ore ad $\frac{1}{3}$ longitudinis 6- (8-) fida, laciniis ad bractearum loborum instar tenuibus armatisque. Loco carinæ tertiæ (posticæ) raro inveniuntur carinæ duæ, approximatæ, unde perianthium inæqualiter 4-carinatum evenit. *Calyptra* libera parva obovata unistrata profunde trifida. *Capsula* magna globosa, in pedicello valido brevi longioreve exserta, 5–8-strata, omnibus stratis columnis fuscis crassis in cellularum pariete fulcitis, intimo fibris semiannularibus notato, 4-valvis, valvulis inæqualiter bipartitis—interdum ad 6-partitis.

Elateres tenues dispiri, omnes deciduí, alii autem in capsulæ fundo longius persistentes. *Sporæ* majusculæ muriculatæ. *Andrœcia* in spica brevi terminali; bracteæ paucijugæ foliis subconformes diandræ.

Hab. In regionibus montosis ad saxa umbrosa arboresque.

Distr. Per orbem terrarum dispersæ, nullibi copiosæ, in Andibus autem sylvaticis, alt. 1200—3500^{m}, sat frequentes et ex arborum truncis ramisque cæspitibus magnis dependentes, ad saxa rariores; in planitie fluminis Amazonum nullibi visæ fuerunt. E speciebus paucis hodie cognitis 4, 2 novas, legi.

Herberta, e foliis prælongis, dicranis, decurvo-secundis, a cæteris fere omnibus hepaticis distat, et *Hypnum uncinatum*, *H. commutatum*, &c., vel *Dicranum scoparium* primo visu valde refert.

Obs. In *Herberta acanthelia* and some other species of which I have been able to examine ripe fruit, the innermost membrane of the capsule is continued over the apex of the pedicel, where it consists of lineari-fusiform, usually pointed cells, lined with semiannular fibre or sometimes with an unbroken spiral. I saw one case of a cell containing a double spiral. It was easily distinguished from the elaters by its much greater width, and the stouter laxer helix; besides by its being laterally connected with other similar cells into a continuous membrane. A few of the basal leaf-cells of some of the species are also lined by a spiral fibre, as was first poined out by Gottsche for *H. juniperina*. A good many elaters remain attached to the base of the capsule for a short time after it bursts, but are soon liberated; they are of the ordinary size and structure.

A. *Folia 4plo fere longiora quam lata.*

1. *H. pensilis.* Albido-viridis subsimplex, nisi pro innovatione subflorali subindeque stolone uno alterove basali. F. fragilia dissita, distiche decurvula, subintegerrima, ab apice ultra ½ bicrura, basi integra ovato-oblonga, cruribus lineari-subulatis acutatis, cellulis vittæ magnis cæteris concoloribus. Br. medio margine inciso-spinosæ. Per. ovato-subulata, laciniis apicalibus basi subspinosis.
2. *H. juniperina.* Robusta flavida, in ætate badia, subramosa flagellifera. F. imbricata deflexo-secunda ovalia, basi utrinque denticulata, ad ½ bifida, cruribus lato-subulatis acuminatis, cellulis omnibus concoloribus. Br. margine hamato-incisæ, ab apice profunde bifidæ. Per. fusiformi-subulata, laciniis apicis basi hamato-incisis.

B. *Folia solum 2plo longiora quam lata.*

3. *H. bivittata.* Robusta fulva subramosa. F. confertissima, distiche devexa, late ovata, ad ½ bifida, basi decurrente plerumque subciliata; cruribus semilanceolatis acuminatis vitta aurantiaca percursis. Br. ciliato-spinosæ, ad ⅓ bifidæ. Per. ovato-lanceolato-fusiformia, laciniis apicis tenuiacuminatis longispinis.
4. *H. acanthelia.* Robusta fulva subramosa flagellifera. F. densa hamato-secunda, basin versus ciliata spinosave, minus distincte vittata, profunde (ad ⅔–¾) bifida, cruribus longissime acuminatis. Br. basi longiciliatæ, superne spinulosæ, ad ½ bifidæ. Per. ovato-subulata, laciniis apicis caudato-acuminatis superne spinosis vel subintegerrimis.

1. HERBERTA PENSILIS (Tayl.).

Sendtnera pensilis, Tayl. Lond. Journ. Bot. (1846).

Hab. e ramis pendula in Andium Quitensium sylvis occidentalibus: *Pichincha* (JAMESON); *Chimborazo* (R. S.).

F 5·5 × 1·4, crura 3·0 × ·3; c. mediæ $\frac{1}{12}$, laterales $\frac{1}{32}$; br. 7·0 × 1·8; per 7·0 × 1·5mm.

Albido-viridis elata laxe cæspitosa. Caules 6–9-pollicares penduli subsimplices, innovando-elongati, interdum basi stoloniferi.

Folia dissita tenuia fragilia distiche decurvo-patula (neque secunda) oblique ovato-oblonga canaliculato-concava; alis undulatis, posticâ dilatatâ caulem transeunte, integerrimis vel basi obsolete sinuato-denticulatis; ultra $\frac{1}{2}$ biloba, lobis cruribusve subæquimagnis angustis lineari-subulatis canaliculatis, apice acutato subexplanatis; cellulæ mediæ pluriseriatæ lineares, laterales triplo fere breviores sinuatæ, omnes concolores minute verrucosæ. Folia 3-4 parium florem fœm. proxime sequentium a basi ad medium valide paucispina.

Foliola foliis paulo augustiora, recta, cæterum conformia.

Flores dioici: fœm. terminales, cum innovatione. Bracteæ plurijugæ arcte imbricatæ suberecto-appressæ, foliis paulo majores firmioresque, medio margine externo inciso-spinosæ, cæterum subintegerrimæ vel sparse denticulatæ, cruribus tenuibus flexuosis margine recurvis.

Perianthia involucro æquilonga ovato-subulata 3- (apice 6-) plicata, apice ad $\frac{1}{3}$ sexfida, laciniis iis bractearum conformibus, basi sola subspinosis.

In sylva *Canelos* adest forma tenuis perangustifolia, crebre stolonifera, aliis flagellis folia parva sola, aliis etiam radicellas prodentibus.

2. HERBERTA JUNIPERINA (Sw.).

Jungermania juniperina Sw. Fl. Ind. Occid.

Hab. ad arbores in sylva *Canelos* et in M. *Tunguragua*, alt. 1800–2400m (R. S. 1857). In insulis Antillis et in Mexico quoque inventa est (SWARTZ, LIEBMANN, &c.).

F 4·0 × 1·15; c. mediæ $\frac{1}{25}$; br 4·5; per 5·5 × 1·0, lac 2·3mm.

Robusta flavo-viridis, inferne badia, in pulvinulos pendulos congesta. Caudex prostratus flexuosus flagelliferus, caules 4–9-pollicares, plus minus pendulos, arhizos, paulo et subfastigatim ramosos, ramosque innovando-proliferos, proferens.

Folia transversa imbricata deflexo-secunda ad $\frac{1}{3}$ bifida, dimidio inferiore ovali convolutivo-amplexicauli, laciniis lato-subulatis (postica subangustiore) inter se ad angulum acutum (20°–40°) divergentibus, sensim acuminatis acutis, subplanis vix fragilibus, margine basi ipsa utrinque subtridenticulata, cætero integerrima vel (superiora præcipue) hic illic denticulo armata; cellulæ axiales elongatæ triplo fere longiores quam latæ, intus ob fibram spiralem inclusam 6–14-sinuatæ, valde pachydermes, laterales 2–3plo minores subrhombeæ, omnes subpellucidæ, cuticula minute verruculosa.

Foliola foliis æquimagna erecta, laciniis æquilatis, magis divaricatis.

Flores dioici: ♀ terminales, innovationibus 1–3 suffulti (quarum altra plerumque elongata iterum prolifera). Bracteæ plurijugæ foliis perpaulo longiores, firmiores, saturatius coloratæ, congestæ decurvo-squarrosulæ profunde (ad $\frac{3}{4}$) bilobæ, lobis canaliculato-sulcatis, margine, basin versus præcipue, incisæ, dentibus varie hamatis.

Pistillidia ad 24 inveni, a basi ovali lineari-teretia, ore lobulis 3 brevibus recurvis hiantia.

Perianthia apice emersa fusiformi-subulata, 5plo longiora quam lata, alte 3-plicata, plicis dorso latis canaliculatis (unde perianthia 6-plicata viderentur), ab apice ultra $\frac{1}{3}$ sexfida, segmentis recurvo-canaliculatis acuminatis, basi hamato-incisis.

Syn. Sendtnera juniperina Endl. Nees; G. L. et N. Syn. Hep. 239; Gottsch. Mex. Leverm.

Forma typica, Antillana et Mexicana, sec. cl. Gottsche folia habet magis armata, utraque basi 5–10-dentata, cellulis basalibus medianis 15–22-sinuatis. Nostra pro var. *andina* habenda, cujus subvars. duas in eodem monte *Tunguragua* inveni: sc.

1. *acutata*, foliis basi subinermibus, cruribus potius acutatis quam subacuminatis appellandis; bracteis ad $\frac{1}{2}$ solum (neque ad $\frac{3}{4}$) fissis minusque armatis.
2. *heteroclada*, 2–3-pollicaris robusta, basi ramosa et crebre flagellifera; foliis magnis latis confertissimis, vix tamen, vel basi sola, imbricatis, distiche vero patentibus et fere squarrosis, parum deflexis, cruribus latioribus brevioribusque.—In sylva Canelos forma parum diversa, ramos e basi alios elatos 9-pollicares subparvifolios, alios breves, foliis maximis (ad 6^{mm} longis) squarroso-patentibus, cruribus angustis, vestitos proferens, invenitur.

3. HERBERTA BIVITTATA, Spruce.

Hab. in monte *Campana* Andium Peruvianorum, ad saxa, alt. 1200^{mm}.

F 3·0 × 1·6, 2·0 × 1·1; *c* $\frac{1}{50}$; *c* vittæ $\frac{1}{16}$—$\frac{1}{12}$; *br* 5·0; *per* 5·0 × 1·5^{mm}.

Cæspites robusti fulvi. Caudex niger prostratus breviusculus flexuosus ramosus rudimentarie foliosus, radicellosus, parce flagellifer; caules assurgentes, dein arcuato-pendulos, 3–5-pollicares, basin versus subnudos, superne densifolios, subramosos, proferens.

Folia transversa confertissima distiche devexo-subsecunda, late ovata, ad $\frac{1}{3}$ bifida, laciniis semilanceolatis acuminatis acutis, parum canaliculatis, margine planis vel apice recurvulis, utraque basi decurrentia et ciliis 3–4 (sæpe obsoletis) aucta, cæterum integerrima vel dente hamato uno alterove hic illic armata, ab ipsa basi vittis (ad nervorum instar) binatis, parum divergentibus, in laciniarum apice evanescentibus, aurantiacis, medio 3–4 cellulas latis, inferne sublatioribus, apice angustioribus, percursa; cellulæ parvæ suboblongæ pachydermes vix scaberulæ, intus sinuatæ, vittarum tamen 3–4-plo longiores, lineares, obscure sinuatæ.

Foliola foliis paulo angustiora, symmetrica, bivittata, utraque basi decurrentia fimbriataque.

Flores dioici: fœm. terminales, innovatione suffulti. Bracteæ plurijugæ arctissime imbricatæ foliis multo longiores, vix ultra $\frac{1}{3}$ bifidæ, exteriores late canaliculatæ, interiores bisulcæ, omnes corrugatæ, margine inferne ciliis retrorsis, superne ad apicem usque spinis dissitis varie hamatis, armatæ, lobis margine recurvis.

Perianthia immersa ovato-lanceolato-fusiformia 3-gono-plicata, plicis dorso sulco exaratis, apice ad $\frac{1}{3}$ fissa, segmentis tenui-acuminatis longispinis.

In eodem monte adveniunt *varietates* duæ, sc.

1. *perissodonta*, robusta, foliis prælatis undulatis, medio margine utrinque spina magna (lobulove) auctis.

2. *subpilifera*, foliis angustioribus paulo ultra medium bifidis, cruribus subpiliferis, margine, basi ciliata excepta, inermibus.—Omnes formæ foliis confertissimis anguste bivittatis conveniunt.—*H. runcinata* (Tayl.), ex insula *Chiloe*, folia caulina habet cordato-oblonga basi runcinato-dentata, quod in nostra solum in f. involucralibus obtinet.

4. HERBERTA ACANTHELIA, Spruce.

Hab. In sylvaticis frigidis montium *Mulmúl* et *Tunguragua*, ad frutices et arborum truncos.

F 4·0 × 2·0, 6·0 × 2·0; *c.* vittæ $\frac{1}{10}$, laterales $\frac{1}{50}$; *br* 9·0 × 3·5; *per* 9·5 × 2·0; cal 3·0^{mm}; caps. valvulæ 3·5^{mm} longæ, cruribus ·7 et 1·0^{mm} latis.

Robusta elata fulva, cæspites magnos pendulos efformans. Caules 3-9-pollicares, e caudice ope flagellorum in matrice alte adrepente, arcuato-dependentes, simplices vel subramosi persæpeque prolifero-elongati. Flagella foliis minutis tristichis bifidis, iis *Cephaloziæ bicuspidatæ* haud absimilibus, sparse vestita; radicellas e medio dorso foliorum, juxta sinum—neque e basi—fasciculatas proferentia.

Folia dense imbricata decurvo-secunda, hamata, ovato-acuminata, concava, margine basin versus runcinato-ciliata, raro subspinosa, ab apice ad $\frac{2}{3}$–$\frac{3}{4}$ usque bifida, cruribus lanceolato-subulatis longissime sensim acuminatis, apice tenui sæpe incano obsolete denticulatis, canaliculatis, altero (postico) dimidio angustiore; cellulæ mediæ valde elongatæ pluriseriatæ utrinque autem in cellulas parvas normales subrhomboideo-fusiformes sensim transeuntes (sicuti solum in cruribus vitta distincta apparet), omnes cellulæ valde pachydermes.

Foliola fere æquilonga, angustiora, paulo ultra $\frac{1}{2}$ fissa, cruribus divergentibus, basi subcordata, auriculis brevibus hamato-ciliatis.

Flores dioici: fœm. terminales, cum innovatione. Bracteæ plurijugæ confertissimæ, foliis dimidio longiores, ad $\frac{1}{2}$ solum bifidæ, basi ciliis longis tortis, superne spinulis hamatis armatæ, bisulcæ et corrugatæ, lobis a basi lata acuminatis, acumine caudiformi flexuoso sæpe decurvo subintegerrimo.

Perianthia vix apice ipso emersa, ovato-subulata, profunde 3-plicata, plicis profunde bisulcis valde corrugatis, ab ore ad $\frac{1}{3}$ usque 6-fida, laciniis basi hamato-ciliatis apice caudato-acuminato spinosis subintegerrimisve. Calyptra triplo brevior obovata albescens opaca, cellulam unicam crassa, demum profunde trifida. Capsula magna subglobosa, pedicello valido sat alte exserta, valvulis profunde bipartitis, cruribus (ad foliorum instar) inæquilatis. Elateres elongati tenues flexuosi, helice duplice impleti. Sporæ majusculæ elateribus 4-plo latiores globosæ crebre muriculatæ.

VIII. LEPICOLEA, Dum.

Recueil, &c. (1835); *Leperoma* Mitt. in Hook. Handb. N. Zeal. Fl. (1867); *Sendtneræ sp.* Syn. Hep. (1845); *Jungermanniæ sp.* Hook. Musc. Exot. (1816).

Plantæ elatæ flavidæ vel grisco-virentes, pinnatim ramosæ, ramis persæpe apice attenuato flagellaribus, omnibus lateralibus.

Folia tristicha incuba sat magna, planiuscula (nec complicata),

profunde bis bifida, laciniis augustis apice sæpe capillaceis, margine (basin versus præcipue) semper fere pulchre ciliatis ; *cellulæ* majusculæ subconformes scaberulæ. *Flores* dioici : ♀ ramulo perbrevi simplice constantes. *Bracteæ* plurijugæ, parvæ, interiores perianthio adnatæ nonnisi apice liberæ. *Perianthia* campanulata, propter bracteas accretas ad speciem ramentaceo-hirsuta. *Calyptra* . . . . *Capsula* (*L. ochroleucæ*, fide cl. Gottsche) brevipedicellata, subglobosa, ad basin usque 4-valvis, 5-strata ; cellulæ stratorum 4 exteriorum pariete irregulariter incrassato, strati intimi fibras semicirculares monstrantes. *Elateres* tenues dispiri ; alii pauci capsulæ fundo adfixi, majores cylindrici, late *unispiri*, demum cum cæteris elateribus decidui. Sporæ . . . . Andrœcia . . . .

Hab. Ad arbores et saxa.

Distr. Per tropicos et zonam temperatam australem sparsæ. *L. ochroleuca*, fide auctorum, neotropica, palæotropica et australasica est ; anne autem unâ solâ specie constans ? Ipse in sylvis Andium Quitensium unicam speciem, antea a cl. Jameson inventam, legi. Sine dubio ad *Lepicoleam* referenda est, *L. ochroleucæ* proxima, quamvis flores utriusque sexus adhuc nobis latent. Quum de nulla *Lepicoleæ* specie fructum examinare mihi contigit, descriptionem capsulæ etc., a cl. Gottsche (Mex. Leverm.) mutuam sumpsi.

Mastigophora Nees. differt perianthio ab involucro perfecte libero ; foliis bi-vel trifidis (nunquam bis bifidis) lobulo postico parvo et complicato ; foliis posticis minoribus, a lateralibus plus minus diversiformibus.

1. Lepicolea pruinosa, Tayl.

Sendtnera pruinosa, Tayl. in Lond. Journ. Bot. (1846), Syn. Hep. 722.

Hab. Andes Quitenses, in monte *Tunguragua*, alt. 2500^{m}, ad arborum truncos et in ipsa terra. In sylvis montis *Pichincha* (Jameson).

F et *f*^{la} 2·7 × 1·6, 1·9 × 1·25, 1·8 × 1·0, *c* $\frac{1}{24}$^{mm}.

Elata robusta cæspitosa flavescens, ætate fuscescens. Caules 6–7-pollicares suberecti pendulive apicem decurvo-circinatum versus sæpe fastigiatim divisi, deinde bipinnati, pinnis subpollicaribus et vel iterum pinnatis vel ex parte dichotomis, pinnulisque apice attenuato decurvo-secundis. Caules ramique paraphyllliis setiformibus, 4–8-cellulas longis, basi sola 2 c. latis, rectis incurvisve, facie inferiore præcipue crebrius obsessi.

Folia arcte imbricata—terminalia densissima—incuba erecta concavula, suboblique ovato-quadrata, ad $\frac{2}{3}$ usque bis bifida, laciniis linearisubulatis capillaceo-acuminatis, toto margine—antico rotundato præcipue—laciniata et longiciliata, ciliis flexuosis, sæpe ramosis intricatisque, apice sæpe canescentibus ; cellulæ majusculæ ovali-hexagonæ subprominulæ leptodermes subpellucidæ verruculosæ. Folia axillaria, e quorum gremio rami orti sunt, cordato-triangularia

acuminata, bicuspidata (nec quadrifida); quoad insertionem semi-anticam cæteris foliis conformia sunt.

Foliola foliis æquimagna vel etiam sublatiora, imbricata, ad $\frac{3}{4}$ bis bifida, laciniis capillaceo-acuminatis, extimis sæpe inæqualiter bifidis, mediis raro subtrifidis plerumque integris, margine toto inæqualiter longiciliato.

Flores nullos invenire potui.

Var. *æquabilis* (*Sendtnera æquabilis*, Tayl. l. c.), forma gracilescens, ad fl. *Napo* a cl. JAMESON, ad fl. *Pastasa* (in sylva *Canelos*) a meipso lecta, folia foliolaque habet subdissita, minus longe ciliata, caules sparsius setulosos, et ramos sæpe ex parte denudatos.—Pruina, a cl. Taylor descripta, forsan plantula parasita erit; paraphyllia contra omnino prætervidit.

IX. CHÆTOCOLEA, nov. gen.

A *Lepicolea* differt statura pusilla, habitu *Cephaloziæ* cujusdam; foliis *succubis*, foliolisque palmatifidis, margine integerrimis; floribus ♀ in caule innovando *terminalibus;* bracteis exterioribus ciliato-multifidis; perianthio (ad *Lepicoleæ* instar macrostomo, e bracteis internis adnatis ramentacco) ore longiciliato, ciliis conniventibus. Cum *Trichocolea* foliis succubis convenit, longius autem distat minutie, foliorum laciniis simplicibus (nec ramosissimis) et perianthii distincti præsentia.—Calyptra, capsula etc. ignota restant. Androecia in diversa planta terminalia, bracteis monandris.

Hab. et *Distr.* Genus in die unica specie, meipso in sylvaticis Andium Quitensium lecta, constat.

1. CHÆTOCOLEA PALMATA, Spruce, (Tab. XII.)

Hab. Andes Quitenses, in monte *Tunguragua* alt. 2400—2700^{m}, ubi sub fruticum umbra, super terram necnon ramulos foliaque emortua, latissime extenditur. Plantæ utriusque sexus immixtæ crescunt, florem autem fertilem invenire non potui.

F. caulina ·8 ad ·9^{mm} *longa*, *lat. media* ·4 ad ·5^{mm}; *laciniæ* ·3 ad ·5^{mm} *longæ; f subfloralia* 1·1 × 1·1^{m}; *foliola* ·4—·45 *longa; cellulæ* $\frac{1}{50}$—$\frac{1}{15}$; *perianthii alt.* 1·3, *circumf.* 3·0, *cilia ad* ·8^{mm}.

Tenella, rufo-badia, late laxe effusa. Caules semipollicares ascendentes tenues fragiles flexuosi, radicellis implexi, parce et subprolifero-ramosi. Rami plerique postici, intra folioli angulum orti, pauci foliis lateralibus axillares. Cellulæ caulis in strata tria concentrica dispositæ, in series longitudinales sub 18 ordinatæ, quarum corticales sub 10-seriatæ, cæteris haud majores, parietibus autem validis opacis et coloratis, interiores leptodermes pellucidæ.

Folia succuba, dissita, apicalia tamen conferta, pleraque late patula, e basi angustiusculâ diagonali cuneata, ad medium usque palmatim 3–5-fida (sæpius 4-fida); laciniis subinæqualibus subulato-setaceis divergentibus, basin versus cellulas 2 v. 3, superne unam solam latis; cellulæ

superiores mediocres majusculæve oblongo-4–6-gonæ, inferiores majores subrectangulares ($\frac{1}{15}$—$\frac{1}{12} \times \frac{1}{30}$ mm), omnes ad angulos parum incrassatæ, cuticula minute verruculoso-striolata.

Foliola foliis duplo breviora, bis bipartita, laciniis setaceis, externis brevioribus, basin versus radicellifera.

Flores dioici: ♀ in caule sæpe innovando-prolifero terminales, capitati. Bracteæ tristichæ, plurijugæ, exteriores foliis majores, latiores, ciliato-multifidæ, ciliis 10–12, aliis ramosis; intimæ perianthio adnatæ, multifidæ, apicibus (laciniis) setaceis solum liberis.

Perianthia subemersa cupuliformia, fere hemisphærica, extus bracteārum apicibus setoso-villosa, macrostoma, ore tamen ciliis prælongis conniventibus fere clausa.

Flores ♂ in planta propria spicam terminalem sistentes; bracteæ pancijugæ, foliis æquimagnæ, 3–4-fidæ, turgidæ, monandræ.

Obs. Cum caulibus floriferis mixti sæpe adveniunt alii plures steriles, filiformes, foliis bi-trifidis et foliolis semel bipartitis vestiti, omnibus laciniis setaceis, iis *Blepharostomatis* simillimis.

X. LEIOMITRA, Lindb.

Hep. in Hibernia lect. p. 515 (1875); *Trichocoleæ* sp. G. L. et N. Spec. Hep.

Plantæ elatæ speciosæ, plerumque denso cespite crescentes, pallidæ vel fulvæ, e foliis capillaceo-multifidis ad speciem lanatæ. Caules validi erecti pendulive, rarius reptantes, subarhizi, pinnati vel bipinnati. *Folia* vel alterna vel subopposita, succuba, basi obliqua inserta, profunde 4–7-fida-partitave, laciniis subulato-capillaciis plurifidis, sæpe primum pinnatis, deinde iteratim 2–3-furcis; lacinulis omnibus capillaceis, cellulis uniseriatis angustis, cylindricis vel truncato-conicis, minute verruculosis conflatis. Folia facie externa nuda, nisi quod in speciebus caule setoso gaudentibus folia caulina simili modo tergo setulosa inveniuntur. *Foliola* foliis subbreviora, pro m. sublatiora, bis bipartita, laciniis ad foliorum instar capillaceo-multifidis. *Flores* dioici: ♀ in caule, interdum etiam in ramis superioribus terminales, innovatione nulla suffulti. *Bracteæ* sub trijugæ, intimæ foliis triplo longiores, primum 10–12-fidæ, plerumque inter se liberæ, extus setis furcatis obsitæ. *Pistillidiā* plurima.

Perianthium proprium nullum. *Calyptra* ovali-vel pyriformi-globosa, involucro velata ab eodem libera, semiinfera tamen, infra medium carnosa ibidemque pistillidiis sterilibus onusta. Pedicellus validus, plerumque breviusculus. *Capsula* magna subglobosa 2–6-strata, cellulis intimis fibris semiannularibus repletis, ad basin usque 4-valvis. *Elateres* sat longi, tenues dispiri decidui. *Sporæ* minutæ, diametro elaterum parum excedentes, scaberulæ. *Andræcia* terminalia; bracteæ paucæ, foliis subconformes, monandræ.

Hab. Ad arborum truncos et saxa, raro in terra vel inter muscos reptantes.

Distr. Paucæ species adhuc cognitæ in sylvaticis montosis zonæ torridæ habitant. Ipse in Andibus 4 species (quarum 3 novas) legi.

Trichocolea Dum. differt bracteis interioribus inter se et cum calyptra basi concretis, apice solo liberis; calyptra clavato-obconica extus bractearum apicibus setoso-ramosis villosa; flore ♀ sæpius in caulis furca posito. Cæterum, quoad habitum, folia primum palmata dein capillaceo-multifida, &c., a *Leiomitra* parum differt. *Hab.* in paludibus zonarum temperatarum (Europa; Novo-Zelandia, &c.).

§ 1. *Caulis inter folia nudus, glaber.*

1. *L. tomentosa.* Virescens fulvave plumæformi-pinnata, pinnis decurvis. F. conferta subopposita profunde 5-fida, limbo basali 2–3-cell. lato, cruribus bis trifidis, medio interdum pinnato. Fl. ♀ in caule et ramis paucis superioribus terminales, corymbulum sistentes. Br. intimæ ad $\frac{1}{2}$—$\frac{2}{3}$ plurifidæ, laciniis sub 12, limbo basali pluricarinato, ad carinas ciliato. Calyptra globoso-pyriformis.
2. *L. flaccida.* Virescens laxe pinnata, pinnis substrictis. F. subopposita, vix ultra dimidium 4-fida, limbo basali 3–6c. alto, cruribus omnibus pinnatis, pinnis 3–2-furcis. Fl. ♀ in caule, raro in ramis, terminales. Br. vix ad $\frac{1}{2}$ fissæ, laterales 10—12-fidæ, media (br^{la}) solum 4-fida. Calyptra globosa.
3. *L. sphagnoides.* Elatissima, albida stramineave, pinnata et bipinnata, frondem linearem sistens. F. alterna densa 5-partita, limbo basali 1–3c.-lato, cruribus pinnatis, pinnis hamatis 3–2-furcis, lacinulis ultimis omnibus (idem ac foliolorum) valde capillaceis.

§ 2. *Caulis paraphylliis scaber.*

4. *L. paraphyllina.* Flavo-virescens, laxe bipinnata, caule paraphylliis setiformibus 2–3-furcis obsito. F. alterna, basi prælata inserta, caulina duplo latiora quam longa, profunde 7-fida, limbo basali sub 6c. lato, cruribus primum verticillatim 3–5-laciniatis dein pinnatis vel bis 2–3-fidis. Fl. in caule terminales. Br. vix ultra $\frac{1}{2}$ in lacinias 10 fissæ. Calyptra magna ovali-globosa.

1. LEIOMITRA TOMENTOSA (Sw.)

Jungermania tomentosa, Sw. Fl. Ind. Occid.

Hab. in sylva *Canelos* Andium Quitensium, ad arborum truncos. (R. S. 1857.) In insulis Antillis, frequens (SWARTZ, HUSNOT, &c.).

F. 1·0 × ·5; *c* $\frac{1}{12}$; f^{la} ·85 × ·8, ·65 × ·5; *f-invol.* 3·0 × 1·3 (*basi*), × 3·8^{mm} (*apice*).

Pallide viridis vel fulva, in cespites suberectos pendulosve congesta. Caules 3-pollicares sæpe subfurcati, deinde plumæformi-pinnati, pinnis 5^{mm} longis plus minus decurvis.

Folia conferta subopposita succuba (insertione ad angulum peracutum) late patentia, apice incurvo-erecta, oblique cuneata, profunde (ad $\frac{3}{4}$—$\frac{4}{5}$) 5-fida, limbo basali 2 vel 3 cellulas lato; segmentis bis trifidis;

laciniis haud in planum porrectis, mediâ autem cujusque fasciculi paulo extante, setaceis apice capillaceo pungentibus. Segmenta secundaria media subinde pinnata, lateralia solum bicrura. Cellulæ angustæ rectangulari-oblongæ, leptodermes, crebre minute verruculosæ, laciniarum tenuiores.

Foliola foliis subbreviora, parum latiora, imbricata suberecta bis bipartita, segmentis subdivergentibus, eodem modo ac folii divisis, laciniis capillaceis intricatis.

Flores dioici. Caulis ipse, persæpeque rami 2 vel 4 breves, subopposite, caulis apici proxime orti, apice (in corymbuli 3–5-floris modum) florem ♀ gerunt. Bracteæ (s. folia involucralia) sub 3-jugæ, inter se liberæ, foliis caulinis triplo majores, magis fissæ, intima ad $\frac{1}{2}$—$\frac{2}{3}$ solum plurifida; laciniis ad 12, bis trifidis; limbo integro basali extus leniter pluricarinato et ad carinas ciliis bi-trifurcis obsesso. Caulis apice, pro calyptræ basis constrictæ et pedicelli basi bulbosi receptione, profunde excavatus. Calyptra involucro subduplo (subinde vix) brevior, globoso-pyriformis, apice demum irregulariter rupta, basi pro brevi spatio cum caulis orificio tubulari concreta, a bracteis tamen libera, juxta basin carnosa et pistillidiis sterilibus obsessa. Capsula magna globosa 6-strata. Elateres tenues elongati bispiri. Sporæ minutæ, diametro elaterum vix duplo latiores.

In m. *Campana* advenit forma ejusdem speciei, fl. ♀ autem semper ramigenis, nunquam in ipso caule terminalibus.

2. LEIOMITRA FLACCIDA, Spruce.

Hab. In sylva *Canelos*, ad arbores vetustas, a. 1857.

F 1·0 × 1·1, 1·1 × 1·3; c $\frac{1}{15}$—$\frac{1}{12}$; f^{la} ·8 × 1·3; *br* 2·5; *cal* 1·5 × 1·5^{mm}.

Pallide viridis flaccida, muscis irrepens intricataque. Caules 3-pollicares laxe pinnati, pinnis brevibus subrectis.

Folia per paria approximata alternave, late (fere squarrose) patentia, basi haud dilatatâ, parum obliquâ v. *fere transversali*, inserta, cuneato-trapeziformia, antice multo longiora, apice vix ultra medium 4-fida, limbo basali antice 6-cell., postice 3–4 cell. lato, laciniis subulato-capillaceis, pinnatis, pinnis paucis 3-(2-)furcis, segmentis ultimis setaceis attenuatis sub 4c. longis; cellulæ magnæ, inferiores vix duplo longiores quam latæ, subpellucidæ verruculosæ. Limbus foliorum rameorum basalis angustior, nisi pro latere supero obliquo, fere parallelogrammus.

Foliola quadripartita (bis bipartita), limbo basali solum 1-2c. lato, foliis breviora latioraque, laciniis iis foliorum simillimis angustioribus, basi hinc—rarius utrinque—folio adjacente connata.

Flores dioici; ♀ in caulis apice incrassato terminales, sine innovatione; bracteæ intimæ foliis $2\frac{1}{2}$-plo longiores, vix ad dimidium plurifidæ, extus setis apice 2–3-furcis crebris obsessæ; laciniis bractearum lateralium 10—12, bracteolæ intermediæ solum 4, iis foliolorum similibus. Calyptra (= bracteæ $\frac{2}{3}$) globosa, basi sola intra caulis apicem recepta eidemque adnata, dein libera, inferne 3–4 cell. crassa ibidemque pistillidiis paucis sparsa, apicem ruptum versus sensim attenuata. [Pistillidia in fl. sterili ad 30.]

Forma in M. *Campana*, in spelunca vigens, eadem est ac *L. flaccida*, floribus ♀ tamen sæpe in ramis abbreviatis terminalibus.

3. LEIOMITRA SPHAGNOIDES, Spruce.

Hab. ad arborum truncos et in terra vegetabili umbrosa, in monte *Tunguragua*, alt. 2500m.

F 1·1 × ·8, ·9 × ·65; *f*ta ·9 × ·9; *c* $\frac{1}{10}$—$\frac{1}{8}$mm.

Cæspites elati densi albidi straminei. Caules 9–12-pollicares rigidiusculi erecti pendulive, pinnati et subbipinnati, frondem linearem sistentes; pinnæ spatio 5mm dissitæ, sub 10mm longæ, decurvulæ, simplices vel plerumque ramulis 1–3 pinnulatæ, densifoliæ.

Folia arcte imbricata alterna, ad insertionem diagonalem fere usque 5-partita, limbo basali 1–3 cell. lato, cruribus pinnatis, pinnis tri-bifurcis incurvo-hamatis, lacinulis capillaceis ad 8 cellulas longis; cellulæ magnæ, basales 2-plo, lacinularum autem 4-plo, longiores quam latæ, pellucidæ asperulæ.

Foliola paulo breviora, sublatiora tamen, 4-partita, laciniis mediis majoribus pinnatis, pinnis 2–3-furcis, lacinulis omnibus valde attenuato-capillaceis.

In eodem monte advenit altera forma ejusdem speciei (ut videretur) caule breviore, 3-pollicari, robustiore, ramis confertis decurvo-secundis sæpe simplicibus; foliis vix tam profunde fissis. Utraque forma solum sterilis visa fuit.

4. LEIOMITRA PARAPHYLLINA, Spruce.

Hab. Andes Quitenses, in trunco carioso montis *Guayrapata*, alt. 3000m; ad saxa umbrosa prope prædium *Antombos*.

Caulis sectio ·85 × ·6, *cell. caulis* $\frac{1}{50}$; *f. caulina* 1·5 × 2·8, *ramea* 1·1 × 1·5; *c. folii* $\frac{1}{16}$—$\frac{1}{10}$; *f*ta 1·3 × 1·5, ·9 × 1·0; *br* 4·5 (*altæ*); caps. 1·6 × 1·5; *calyptra* 3·0 × 2·5; *clateres* ·45 —·5; *anth.* ·25mm.

Laxe cæspitosa, e pallide viridi flavida. Caules 4-pollicares laxe bipinnati, ramis ramulisque paucis dissitis decurvulis, validi, albidi, ubique inter folia paraphyllíis setiformibus semel bisve 2–3-fidis obsessi.

Folia succuba imbricata alterna, basi prælatâ subobliquâ inserta, caulina duplo latiora quam longa, profunde 7-fida, limbo basali cellulas sub 6 lato; laciniæ assurgentes, basi 3–4-cell. latæ, subulato-capillaceæ, primum in crura 3–5 *verticillatim* divisæ, deinde subpinnatæ vel bis tri-bifidæ, cruribus omnibus subdeflexis cellulis uniseriatis conflatis apice sensim attenuatis; f. ramea minora, solum 5-fida, cæterum subconformia; folia omnia facie externa setis 2–3-furcis, basin versus præcipue, sparsa; cellulæ magnæ, subcylindricæ, vix duplo longiores quam latæ, verruculosæ, fere vacuæ.

Foliola inimbricata, suberecta, foliis paulo breviora angustioraque, profunde bis bifida, postea ad foliorum instar fissa.

Flores dioici: ♀ in caule terminales, sine ulla innovatione. Bracteæ congestæ, tres intimæ foliis 3-plo longiores, in cupulæ formam verticillatæ, liberæ tamen, vel bracteola (media) hinc cum bractea adjacente basi connata, vix ultra $\frac{1}{2}$ plurifidæ, laciniis ad 10, eodem modo ac foliorum divisis, extus setosæ. Calyptra magna, libera, basi sola cum caulis orificio apicali concreta, ovali-globosa, a basi ad medium usque incrassata et pistillidiis sterilibus plurimis onusta. Pedicellus 8—10mm altus, involucrum solum duplo superans. Capsula magna subglobosa, fere nigra, ad basin usque in valvulas 4, ovali-lanceolatas obtusas opacas bistratas fissa. Elateres elongati

tennes bispiri. Sporæ minutæ, diametro elateres vix excedentes, minute scabernlæ.

Andrœcia in caule ramisve terminales vel subterminales; bracteæ paucijugæ, foliis proximis vix diversæ; antheridia solitaria magna globosa stipitata.

Cum typo advenit forma brevior, magis robusta, fulva, sæpe simpliciter pinnata, foliolis plerisque 6-fidis.

Subtribus IV. *TRIGONANTHEÆ.*

Spruce in tract. 'De *Cephalozia.*' *Lepidozieæ* Lindberg, Hep. Hibern, ex p. *Trichomanoideæ* N. Syn. Hep. ex p.

Plantæ elatiusculæ vel pusillæ, interdum minutæ, pro m. depresso-cæspitosæ, latas plagas sistentes; viridos vel haud raro albicantes flavidæve, rarius badiæ luridæve, in perpaucis speciebus roseo pictæ. *Caules* prostrati vel assurgentes, nunc validi, nunc tenuissimi, diverso modo ramosi; alii rami, floriferi præcipue—in quibusdam generibus omnes—postici; in unico genere *Anomoclada* rami foliosi et floriferi antici, radicelliferi postici, nullo laterali. *Folia* alterna, in perpaucis opposita, omnimodo inserta, omniformia fere inter setacea et orbiculata, raro ad squamulas minutas redacta, in *Cephaloziæ* subgenere *Pteropsiella* in limbum alæformem connata; in paucis integra, in plerisque biloba, in plerisque aliis 3–4-lobata-dentatave; margine integerrimo vel dentato, plano vel incurvo (nunquam, ut videtur, recurvo); *cellulæ* persæpe majusculæ vel mediocres, in perpaucis præminutæ. *Foliola* in aliis nulla vel adventitia, in aliis parva minutave, in perpaucis (*Lepidoziæ* speciebus præcipue) foliis lateralibus parum minora. *Flores* in speciebus robustioribus semper fere dioici, in pusillis sæpe monoici (raro paroici); feminei vix non constanter in ramo hypogeno, brevissimo vel longiusculo, in quibusdam *Cephaloziis* autem in ipso caule, terminales. *Bracteæ* trijugæ vel pauciores, tristichæ, rarissime solum distichæ, foliis rarius conformes, sæpe majores, magis fissæ, intimæ interdum in cyathum plus minus alte connatæ, a perianthio autem liberæ. (In genere marsupialio, *Kantia,* bracteæ in ætate etiam parvæ restant, squamiformes, marsupii orificium circumstantes). *Pistillidia* 10–20. *Perianthium* (*Kantiæ* excepto) semper præsens, tam ab involucro quam a calyptra perfecte liberum, trigonum—a fronte subplano compressulum, angulos duos laterales, tertium posticum ostendens—raro 3–6-gonum; angulis plicisve constanter inermibus, superne argutioribus, unde peranthium (initio sæpe hians) apice plus minus subulato-constrictum evenit, ore repando, dentato

vel ciliato, raro laciniato. Marsupium *Kantiæ*, "perianthium" sistens, pendulum, subcylindricum carnosum, radicellis villosum. *Calyptra* plerumque parva, pyriformis, sæpe carnosula, in plurimis perfecte libera et supera, in paucis dimidio inferiore receptaculo (cum suis pistillidiis) adnata; in *Kantia* cum marsupio alte concreta, ipso apice pistillidia sterilia gerens. *Capsula* in pedicello breviusculo vel elongato, sat magna, vix unquam subglobosa, pro more oblonga vel subcylindrica, ad basin usque 4-valvis; valvulæ rectæ—solum in *Kantia* contortæ—bistratæ, in *Lepidozia* tamen et *Bazzania* 4–5-stratæ; cellulæ strati intimi semper fere fibris semiannularibus fulcitæ. *Eateres* tenues dispiri. *Sporæ* minutæ globosæ sæpius asperulæ. *Andræcia* in plerisque speciebus amentulis hypogenis tenuibus constantia; in aliis autem ad ramos, raro ad caulem, spicam apicalem, mediam vel basalem sistentia, bracteis foliis normalibus consecutivis. *Antheridia* normaliter solitaria, solum in plerisque *Bazzaniis* binata.

This subtribe is, with very rare exceptions, well distinguished from the two preceding ones by the ♀ flowers being hypogenous, or postical, usually on a branch shortened down to the floral envelopes alone. Of genera already described, *Porella*, *Lepicolea*, &c., have the flowering branches similarly abbreviated, but laterally—not postically—inserted on the stem. The few aberrant species of *Trigonantheæ* with lateral (pleurogenous) or acrogenous ♀ flowers belong mainly to the genus *Cephalozia*.

Not only are the ♀ branches mostly postical, but normally-leafy branches having the same origin exist in nearly every genus; and in some genera all the branches—leafy, floriferous, and radicelliferous—are solely postical, e. g., in *Kantia*, *Arachniopsis*, *Adelanthus*, and in most *Cephaloziæ*. The unique feature of *antical* leafy and flowering branches, combined with postical rooting branches, and the entire absence of lateral branches, characterises the curious genus *Anomoclada*, whose inflorescence and fruit are almost exactly those of *Cephalozia*.

The ♂ organs, in most *Trigonantheæ* relegated to minute postical catkins, are less constant than the ♀ to that position. Even in genera where the ♀ flowers are invariably postical, the ♂ flowers may form a spike terminating a lateral branch, as in certain *Lepidoziæ*, especially the minuter species; or the andrœcium may be basal, medial or terminal on a branch, or even on the main stem, the bracts being consecutive with leaves of normal form, which is to be noted in several *Cephaloziæ*.

The trigonous perianth (with the third angle on the underside), usually so constricted upwards as to end in a narrow pyramid, prevails nearly throughout the *Trigonantheæ*. A fourth angle is added on in *Mytilopsis*, and occasionally in certain *Bazzaniæ*. In a few *Cephaloziellæ* supplementary angles make the perianth 3–6-angled, the number of angles varying often in one and the same species.*

* See, for a fuller account of the morphology of the perianth in *Trigonantheæ*, the memoir 'On *Cephalozia*,' above-cited.

The equably tristichous foliage, which with few exceptions prevails throughout the *Ptilidieæ*, has no parallel in *Trigonanthæ*, and rarely any approach to it. In *Lepidozia* the underleaves are in rare cases nearly as large as the side-leaves, but the constantly hypogenous fructification separates the genus from all *Ptilidieæ*.

Conspectus generum.

§ 1. *Rami omnes hypogeni s. postici, rarissime in subgenere* Cephaloziella *ex p. laterales. Folia alterna. Antheridia normaliter solitaria. Capsulæ bistratæ.*

A. *Perianthium normale. Folia succuba v. subtransversa, foliolis (nisi floralibus) persæpe carentia.*

11. Arachniopsis. F. capillacea, aliarum specierum unicrura, aliarum bicrura, cruribus ab ipsa basi distinctis. Fl ♀ constanter cladogeni.
16. Cephalozia. Caules omnibus fere prostrati tenelli, paucis subrobusti. F. sat lata (nunquam capillacea) integra bifidave, raro bipartita, margine integerrima in perpaucis dentata; rarissime nulla præter ad florescentias. Fl. ♀ in plurimis cladogeni, in aliis autem ex p. cladogeni. Calyptra perfecte supera, pistillidiis sterilibus basi circumdata. Caps. oblonga.
17. Adelanthus. Caules e caudice repente suberecti pauciramei flagelliferi, apice subcircinati. F. sat magna et lata subrotunda decurvo-secunda, utplurimum argute dentata (ad *Plagiochilæ* instar, basi autem antica incurva—nec recurva), reti valido, folii mediam basin versus persæpe longiore vittam sistente. Fl. constanter cladogeni. Cal. semiinfera, dimidio inferiore pistillidiis sterilibus onusta.
15. Mytilopsis. Caules e caudice rhizomatoso orti, cum foliis compresso-plani, frondem simulantes, solum e facie postica subramosi. F. arcte complicato-biloba, lobis valvulisve æqualibus, ad apicem usque connatis. F^{la} nulla. Fl. cladogeni: ♂ monandri. Per. longum et angustum inferne 4-angulum, apice 6–8-plicatum longiciliatum. Caps. oblongo-cylindrica.

B. *Perianthium marsupium subterraneum sistens.*

19. Kantia. F. incuba, foliolis majusculis ubique adjectis.

§ 2. *Rami foliosi et floriferi antici, radicelliferi postici.*

18. Anomoclada. F. succuba, foliolis adjectis.

§ 3. *Rami foliosi—interdum etiam masculi—laterales, unde caulis pinnatus dichotomusve evadit. Raro adjectus est ramus posticus normaliter foliosus et ramulosus. Rami radicelliferi (flagella) autem, ut et feminei—plerumque etiam masculi—postici; floriferi simplicissimi. F. incuba. F^{la} ubique præsentia. Capsula valida, sæpius pluristrata.*

12. Lepidozia. Caules pinnatim ramosi, sæpe plumæformes, in paucis speciebus flagella postica proferentes. F. oblique ovato-subrotunda vel subquadrata, palmatim fissa, rarius partita, laciniis 2–6, sæpissime 4. F^{la} paulo minora, subconformia, symmetrica tamen. Fl. ♂ monandri.
13. Bazzania. Caules dichotomi, postice floriferi et valde flagelliferi. F. falcata angusta, oblique semicordato-ovato-ligulata, apice truncato

2–3-raro 4-dentata. F^la 2–4-plo breviora, subquadrata, apicepl erumque 4-crenata-incisulave raro integra. Fl. ♂ diandri, raro monandri.

14. MICROPTERYGIUM. Caules laxe pinnati, necnon e facie postica interdum subramosi et flagelliferi. F. (idem ac in *Mytilopsi*) complicato-biloba, ad carinam late alata, lobo inferiore sat minore. F^la 2–10-plo breviora, apice 3–4-dentata-spinulosave. Fl. ♂ monandri.

XI. ARACHNIOPSIS, Spruce.

in tractatu de *Cephalozia*, p. 84 (1882).

Plantæ pusillæ confervoideæ, griseo-vel cœruleo-virescentes, ad telaraneæ instar late intextæ. *Caules* filiformes, laxe corticati, postice ramosi et radicellosi. *Folia* capillacea stricta, cellulis cylindricis, 2–6plo longioribus quam latis, uniseriatis constantia et vel unicrura vel in aliis speciebus bicrura; cruribus ab ipsissima basi discretis, altero (antico) paulo inferius inserto. *Foliola* subnulla. Flores ♀ cladogeni; *bracteæ* tristichæ, 3–5-jugæ, 2–4-partitæ, laciniis capillaceis e limbo basali angusto ortis. *Pistillidia* sub 12. *Perianthia* prælonga, linearia, superne (saltem) trigona, ore longe 12-ciliato-laciniata. *Calyptra* tenuis libera. *Capsula* oblonga, ad basin usque 4-valvis, bistrata; cellulæ strati interioris fibris semiannularibus (interdum subobsoletis) fulcitæ. *Elateres* dispiri breviusculi, basales subbreviores et obtusiores. *Sporæ* minutulæ eodem ac elaterum diametro. Andrœcia acrogena, brevispica, bracteis monandris.

Hab. et Distr. Loca umbrosa humida ad terram et ligna semiputrida juxta fluvios *Negro et Uaupés*, in Brasilia boreali; in Andibus Peruvianis sylvaticis rarius.

Blepharostoma, habitu subsimile, distat caule dichotomo, foliis tristichis, &c.; *Micro-Lepidozia* § *Telaranea* caule pinnato (ramis lateralibus), &c.

§ 1. *Folia unicrura.*

1. *A. Pecten.* Dioica minuta cœrulescens. Caulis cellulis 5-seriatis—sc. corticalibus 4-, axialibus 1-seriatis—conflatus. F. simplicia pectinatim patula longisetacea, cellulis 4 vel 5 linearibus constantia. Br. tristichæ foliaceæ 4-partitæ.

§ 2. *Folia bicrura.*

2. *A. coactilis.* Monoica pusilla e viridi grisea, in sicco albescens. Caules e cellulis 5-vel 6-seriatis conflati. Folia dissita; crura cellulis 6–10, subduplo longioribus quam latis constantia. Br. intimæ foliis paulo longiores, 2–3-partitæ. Per. cylindracea 4–6-plo longiora quam lata, ore triplicata et longiciliata.

3. *A. dissotricha.* Dioica, cæspite densiore rigidulo vigens. Caules cellulis

sub 12-seriatis conflati. Folia conferta; crura subparallela, cellulis 4 v. 5, triplo fere longioribus quam latis, conflata. Foliola ad cellulas 2 minutas, transverse collaterales, redacta, radicellifera. Br. intimæ foliis triplo longiores 4-partitæ. Per. lineari-fusiformia trigona, ore longe 12-ciliata.

1. ARACHNIOPSIS PECTEN, Spruce (Tab. XIII.).

Hab. Ad fluviorum *Negro* et *Uaupés* cataractas, in terra rupibusque humidis umbrosis. Perichætia perrara ad *Catanacunámi* fl. *Guainia* (i.e. fluvium Negro supra fl. *Casiquiari* ostia) inveni, perianthia autem nullibi.

F ·3–·5^{mm} *longa; c* $\frac{1}{8}$^{mm} *longæ; rami* ♀ 1·2–2·0; *br* ·8^{mm}.

Minuta cœrulescens depresso-cæspitosa. Caules $\frac{1}{4}$–1-pollicares filiformes ascendentes araneoso-intexti, parum radicelliferi, postice subramosi, ramique e cellulis 5-seriatis conflati; cellulæ sc. corticales 4-seriatæ, quarum anticæ biseriatæ magnæ cylindricæ vacuæ, posticæ biseriatæ duplo minores; axiales autem solum uniseriatæ, angustæ, sectione quadratæ, chlorophyllosæ.

Folia dimidio numero cellularum caulis faciei superioris, alterna, pectinatim patula, parum assurgentia, *unicrura*, setacea, stricta, cellulis 4 vel 5, uniseriatis, cylindricis et 3–4plo longioribus quam latis, lævibus, parum chlorophyllosis, terminali parvâ, conflata. Foliola nulla.

Flores dioici: ♀ in ramo perbrevi, vel sublongiore, postico assurgente, terminales, innovatione nullâ. Folia subfloralia (quando adsint) 2–3-juga, sæpe tristicha, uni-bicrura. Bracteæ propriæ capitato-congestæ 3–4-jugæ, tristichæ, patentes vel conniventes, foliis duplo longiores, exteriores liberæ 4-partitæ, limbo basali 3 cellulas lato, laciniis capillaceis, cellulis 6 vel 7 uniseriatis—aliarum ipsa basi biseriatis—conflatis; bracteæ 3 intimæ basi inter se connatæ, altius integræ, laciniis 4 vel pluribus. Pistillidia sub 12, brevia.

Obs. The cells of the stem are usually opposite (i.e., collateral) or nearly so, but towards the point of the branches the cortical cells of the upper face sometimes become alternate. The hair-like leaves spring from the junction of two consecutive cortical cells, and they stand (on each side of the stem) two—very rarely three—cells apart. In the structure of the stem and the position of the leaves there is great resemblance to *Cephalozia monodactyla*, but the other characters are widely different.

2. ARACHNIOPSIS COACTILIS, Spruce (Tab. XIII.).

Hab. Panuré fluvii *Uaupés*, in lignis putridis. *S. Carlos* del *Rio Negro*, supra vimina emortua. Etiam in Andibus Peruvianis, alt. 1200^{m} (var. *capillacea*).

F ·6–·75; *c* $\frac{1}{2}$; *br* ·8; *per* 1·5–1·8 × ·3, *cilia* ·5; *caps* ·5 × ·25^{mm}.

Prostrata late effusa e viridi grisea, siccando albescens cinereave. Caules pollicares serpentini filiformes, cellularum 5–6 seriebus conflati, sc. cellulis corticis 4-seriatis, axeos 1–2-seriatis et angustioribus; perpaulo ramosi, ramis omnibus posticis.

Folia plus minus dissita, angulo 50° patentia, cruribus 2, ab ipsa basi sejunctis, filiformibus flexuosis subdivergentibus constantia; cellulæ

cujusque cruris 6–10, uniseriatæ, subduplo longiores quam latæ (in *var.* elongatæ) pellucidæ fere vacuæ. Foliola 0.

Flores monoici: ♀ ramo brevissimo postico assurgente tristichophyllo constantes. Bracteæ intimæ foliis paulo longiores bi-tricrures, cruribus subinæquilongis inferne duplici cellularum serie conflatis.

Perianthia involucrum duplo et ultra superantia, 4–6plo longiora quam lata, cylindracea, solum ore constricto triplicata et longe ciliata, ciliis sub 12. Capsula oblonga, vix subcylindrica.

Andrœcia in ramo terminales; bracteæ paucijugæ, foliis vix diversæ, magis confertæ, incurvæ, monandræ.

Var. *capillacea* S. a typo differt foliis tenuissimis, cellulis prælongis, 3–6plo longioribus quam latis, constantibus.—In monte Campana, ubi ad speluncarum parietes tanquam aranearum telarum instar dilatatur.

Var. *filifolia* S. Foliorum crura longissima (1·5–1·8^{mm} longa), e cellulis 10–14, duplo (raro triplo) longioribus quam latis, uniseriatis conflata. Perianthia prælonga (2·3 × ·4^{mm}) tereti-fusiformia, ore angusto triplicata longiciliataque. Bracteæ intimæ perianthio perpaulo breviores.—Forma insignis, cum normali mixta, ad Panuré crescit: forsan pro specie propria habenda.

3. ARACHNIOPSIS DISSOTRICHA, Spruce.

Hab. Ad fluvium *Uaupés*, in rivuli ripis umbrosis arborum radices investiens.

F ·3–·35; *c* $_1^1{}_2$ × $\frac{1}{30}$–$\frac{1}{36}$; *br* 1·0; *per* 1·8 × ·35^{mm}.

Cæspites lati densi griseo-virides. Caules pollicares procumbentes intricati inæqualiter subpinnati, compressulo-teretes, cellulis strati corticalis 6-vel 7-seriatis magnis cylindricis vacuis, cellulis centralibus sub 6-seriatis multo angustioribus subchlorophyllosis; rami omnes postici, ad foliorum insertionem subdilatati; adveniunt etiam (sed rarius) flagella aphylla elongata flexuosa devexa, fasciculos rhizinorum parvos tristichos gerentes.

Folia conferta patentia, longitudinaliter (vix oblique) inserta, ad basin usque bipartita, succuba—sc. crure antico præposito et paulo inferiore, posticum basi paulo (ad $\frac{1}{4}$ lat.) imbricante; crura e cellulis 4 v. 5 uniseriatis conflata, stricta, angulo peracuto inter se divergentia, vel parallela, quin etiam (sed raro) in unicum coadunata; cellulæ magnæ, triplo fere longiores quam latæ, subcylindricæ vel truncato-conicæ, læves, chlorophyllo parco in sicco ad cellulæ utrumque finem congesto, apicales tamen minutæ ovales.

Foliola ad cellulas duas minutas truncatas, caule exstantes, collaterales (foliolum rudimentarium bicrurum referentes) redacta, parce rhizinophora.

Flores dioici: ♀ in ramulo perbrevi, foliis 0–3-jugis minutis normalibus basi stipato, terminales, assurgentes. Bracteæ trijugæ tristichæ, intimæ majores, foliis caulinis triplo longiores, erectæ, profunde 4-fidæ; laciniis capillaceis, inferne 2 cell., superne 1 cell, latis; basi indivisa 3–4 cell. alta, interdum processulo utrinque aucta.

Perianthia foliis 5-6plo longiora, 5plo longiora quam lata, lineari-fusiformia trigona, ore connivente longe 12-ciliata.

Andrœcia vel ramum totum vel ejus apicem solum tenentia; bracteæ foliis similes, magis confertæ, assurgenti-secundæ, monandræ.

XII. LEPIDOZIA, Dum.

Recueil (1835); G. L. et N. Syn. Hep. 200 (1845).

Plantæ elatiores, raro pusillæ, albido-vel flavido-virescentes, raro viridissimæ, dense cæspitosæ, cæspitibus depressis, rarius erectis pendulisve. *Caules* in plerisque validi, pulchre plumæformes, pinnati vel bipinnati, facie postica fructiferi; *rami foliosi* pro m. omnes laterales, plus minus deorsum arcuantes, interdum apice attenuato radicantes; rarius, et in speciebus pusillis præcipue, accedunt rami postici normaliter foliosi, vel frequentius ad flagella radicellifera redacti. *Folia* incuba, parvula, in aliis speciebus præminuta, plerumque tam lata quam longa, valde obliqua tamen, margine antico multo longiore et magis rotundato, decurvo-concava vel fornicata, palmatim 4-fida-partitave, raro 5–6-vel solum 2–3-fida, laciniis subulatis, cæterum integerrima vel basi antica paucis spinis armata, in paucis speciebus toto margine dentata; *cellulæ* sæpe parvulæ ($\frac{1}{50}$–$\frac{1}{25}$mm longæ) quadrato-hexagonæ, inferiores subelongatæ, ad angulos vix incrassatæ, cuticula sæpe asperula; in *Micro-Lepidoziis* autem minutulæ oblongo-quadratæ. *Foliola* foliis subconformia, symmetrica tamen, in *Eu-Lepidoziis* perpaulo minora, in *Micro-Lepidoziis* autem foliis duplo minora. *Flores* dioici, in perpaucis (inprimis *Micro-Lepidoziis*) monoici: ♀ ad caulem, rarius ad ramos, hypogeni. *Bracteæ* 3–5-jugæ, appressæ, concavæ, intimæ foliis plerumque subtriplo (in speciebus parvifoliis ad 8-plo) majores, apice 2–4-fidæ, margine denticulatæ vel spinosa. *Pistillidia* 20 vel pauciora, sterilia in calyptræ basi et paulo altius persistentia. *Perianthia* semper fere prælonga—in *L. subdichotoma* 30-plo longiora quam folia caulina(!)—ovato-subulata vel anguste fusiformia, superne obtuse trigona, in *Eu-Lepidoziis* carnosa, ore integerrimo vel denticulato, in *Micro-Lepidoziis* leptodermia, ore ciliato-laciniato. *Calyptra* 2–4-plo brevior, pyriformis oblongave, inferne carnosula, vel in *Micro-Lepidoziis* ubique tenuis, demum bilabiatim rupta. *Capsula* in pedicello valido pro m. breviusculo exserta, oblongo-cylindrica, interdum calyptrâ imo longior, ad basin usque 4-valvis, 2–4-strata; cellulæ columnis parietalibus fulcitæ, intimæ fibris semiannularibus impletæ. *Elateres* tenues bispiri. *Sporæ* minutæ, læves vel asperulæ. *Andrœcia* sæpissime ramulo tenui postico constantia, raro (et in *Micro-Lepidoziis* præcipue) in ramis lateralibus terminalia; *bracteæ* 5–10-jugæ, suborbiculatæ concavæ, apice plerumque

(idem ac bracteolæ duplo minores) bidentatæ; *antheridia* solitaria magna pedicellata.

Hab. Ad saxa arboresque, necnon in ipsa terra turfosa umbrosa, vel super muscos reptans.

Distr. Nulla terra exules, in zona æquatoriali montes sylvaticos diligunt, planitiem calidam fugiunt. In Andibus Quitensibus et Peruvianis, inter 800^{m} et 3000^{m} alt., ad arborum truncos et radices valde abundant, ad saxa rariores. In planitie Amazonica unicam speciem, *L. Amazonicam* n. sp., in statu solum sterili, semel legi; præter *L. chætophyllam*—speciem ambiguam, melius forsan pro genere proprio (*Telaranea* nob.) habendam—per totam planitiei sylvam, necnon in Andium radicibus dispersam.

Subgenus I. EU-LEPIDOZIA.

(= *Eu-Lepidozia* + *Ptilo-Lepidozia*, Spruce in Journ. Bot. 1876).

Plantæ pro more elatæ, cæspitosæ vel dense stratificatæ, pinnatæ, plus minus plumæformes; rami foliosi in plerisque omnes laterales, in perpaucis sp. adveniunt etiam postici (rarissime flagellares). Folia incuba, breviter, vel ad $\frac{1}{2}$ usque—raro ultra—quadrifida. Perianthia carnosa, 2–4-strata, ore subintegerrimo denticulatove, raro subsetuloso.—Omnes species in America meipso lectæ dioicæ sunt; omnes Andinæ, nulla Amazonica. *L. reptans* autem, Europæa, paucæque aliæ monoicæ sunt.

§ 1. *Foliis foliolisque basi pro more inermibus.*

1. *L. laxepinnata* Spruce. Elata albido-viridis semel bisve laxepinnati, ramis breviusculis sæpe apice flagellaribus. F. distantia patula planiuscula late oblonga, vix ad $\frac{1}{4}$ fissa, laciniis triangularibus acutis; cell. mediocres. F^{la} vix duplo minora, breviter 4-loba. Br. intimæ eroso-ciliolatæ apice bidentatæ. Perianthia foliis 5-plo longiora tenui-fusiformia, inferne 2 cell. crassa, ore integerrima.
2. *L. cupressina* Sw. var. *tenuicuspis* Spruce. Elatiuscula albescens dense stratificata, caule arcte pinnato, raro bipinnato, ramis decurvis apice sæpe flagellaribus. F. densa ovato-subrotunda fornicata, margine antico valde gibboso-convexa basique semicordata, paulo ultra $\frac{1}{3}$ 4-fida, lac. triangularibus tenui-acuminatis, antica longiore; cell. parvulæ. F^{la} fere æquimagna oblongo-rotunda ultra $\frac{1}{3}$ 4-fida, lac. capillari-cuspidatis. Br. intimæ postice connatæ, ad $\frac{1}{2}$ 4-fidæ, lac. abrupte acuminatis, antice subspinosæ. Per. foliis fere 5-plo longiora, ovato-subulata, bistrata, ore ciliolata.
3. *L. subdichotoma* Spruce. Rufo-viridis, caule vimineo pinnato, pinnis subdichotomis. F. distantia *minuta* quadrato-subrotunda incurva, ad $\frac{1}{3}$ 3–4-fida, lac. subulatis subobtusis; cell. parvæ. F^{la} minora quadrata ad $\frac{1}{2}$ digitatim 4-fida. Br. foliis 6–8-plo longiores orbiculatæ concavissimæ, 3–4-apiculatæ, margine subspinulosæ. Per. pro foliis maxima, 30-plo longiora, lineari-fusiformia, apicem versus profunde trisulca, ore subintegerrimo.
4. *L. cæspitosa* Spruce. Humilis virescens, caule pinnato, ramis decurvis, aliis apice tenuibus, posticis (perraris) foliosis nec flagelli-

formibus. F. densiuscula incurva cuneato-subquadrata, basi antica dilatata, paulo ultra ½ 4-fida, laciniis subæqualibus subulatis acutis ; cell. parvæ. F^la fere conformia, subminora. Br. foliis vix duplo longiores, apice 2—3-dentatæ, margine subspinulosæ. Per. prælonga et angusta (9plo longiora quam lata) fusiformi-tubulosa, subteretia, 3—4-strata, apice solo leniter trisulca, subintegerrima.

§ 2. *Foliis foliolisque basi armatis.*

5. *L. dendritica* Spruce. Elatiuscula viridis, caule bipinnato dendroideo. F. caulina subcontigua, oblique ovato-triangularia, cucullato-concava, ad ⅓ fissa, laciniis subulatis acutis, basi subspinosa ; cell. parvæ. F^la subminora subquadrata ad ½ 4-fida, laciniis angustis vix acutis, basi subarmata.
6. *L. macrocolea* Spruce. Elata viridis, caule tenui laxe bipinnato apice circinato, ramis breviusculis pendulis, nullo apice flagellari. F. caulina dissita, ramea subimbricata, subquadrato-ovata concava, ultra ½ 4-fida, lac. acuminatis, basi hastata utrinque 1–3-spinosa. F^la vix minora subconformia, magis profunde fissa. Br. ovato-orbiculatæ subdenticulatæ apice obsolete 4-spinæ. Per. maxima, f. caulinis 12-plo longiora, 4-strata, ovato-subulata superne profunde trisulca, ore subintegerrimo.
7. *L. tenuicula* Spruce. Mediocris pallida, laxe pinnata v. bipinnata, ramis brevibus. Folia dissita oblique ovata, basi antica semicordata 1–2-spina, ultra ½ quadrifida, lac. acuminatis. F^la subminora, lac. lineari-subulatis obtusis, utraque basi 1–2-dentata.

Subgenus II. MICRO-LEPIDOZIA.

Plantæ pusillæ tenues, inter muscos reptantes vel depresso-cæspitosæ. Flagella postica in paucis sp. obvia. Folia transversa profunde fissa partitave. Perianthia tenuia *unistrata, ore ciliato-laciniata.* Species aliæ monoicæ, aliæ dioicæ ; unicam ad fl. Amazonum, cæteras in Andibus inferioribus legi.

§ 1. *Folia basi ad cell. 2–4 alt. usque integra, laciniis utplurimum subulatis. Bracteæ latæ apice solo fissæ.*

8. *L. serpens* Spruce. Pusilla pallida, caule semipollicari tenui vage subpinnato, flagellis 0. F. dissita cuneata ad ¾ trifida, pagina basali 4 cell. alta, lac. acuminatis basi 3 v. 4 c. latis. F^l duplo breviora, lac. basi 2 c. latis.
9. *L. fusifera* Spruce. Cæspitosa, e viridi olivacea, caule pollicari laxe pinnato et bipinnato, flagellis posticis raris. F. imbricata oblonga 3–4-partita (pagina 2 v. 3 c. alta), lac. lineari-subulatis basi 2 v. 3 c. latis. F^la subminora ad basin fere usque 2–3-partita, lac. capillaribus. Br. ovatæ appressæ subdenticulatæ, apice recurvulo subacuminato 2–3-fidulæ. Per. foliis 10plo longiora, unistrata, superne 3-v. 6-sulca, ore in lacinias plurimas subulato-attenuatas fissa.
10. *L. amazonica* Spruce. Minuta badia, caule ⅓ poll. longo paucirameo, raro subpinnato, interdum flagellifero. F. minuta confertiuscula patula, cuneata, 3-partita, pagina baseos 1–2 c. alta, lac. subulatis obtusis. F^la duplo breviora bipartita, cruribus capillaribus.

§ 2. *Folia in ipsa basi fissa ; cruribus vix ad ⅓ cellulæ basalis altitudinis*

usque connatis, capillaceis, cellulis majusculis uniseriatis conflatis. Bracteæ angustæ 3–5-*partitæ.—Habitus confervoideus.* (=TELARANEA *nobis* nov. gen. ?)

11. *L. chætophylla* Spruce. Albicans flaccida pellucida, caule pollicari vage vel pinnatim ramoso, ramis lateralibus—paucis posticis (foliosis) interdum adjectis—flagellis 0. F. dissita (ramea contigua) 3-partita cruribus 4–7 cell. longis. F^{la} duplo breviora, cruribus (2 v. 3) 3 cell. longis. Per. magna tenuia fusiformi-subulata, supra medium trigona, ore longiciliato.

1. LEPIDOZIA LAXEPINNATA, Spruce.

Hab. Andes Peruvianos, in declivibus umbrosissimis montium *Guayrapurina* et *Campana*, alt. 900–1200^{m}.

F ·9 × ·6; 85 × ·75; *c* $\frac{1}{3\,5}$–$\frac{1}{2\,5}$; f^{la} ·55 × ·45; ·45 × ·4; *br* 1·5 × 1; *per* 4·2 × ·8; *caps* 1·25 × ·25^{mm}.

Elata cæspitosa albido-viridis. Caules 3–6-pollicares validi semel bisve laxepinnati, ramis dissitis breviusculis parum decurvis apice sæpe flagellaribus.

Folia caulina distantia, ramea magis approximata, late patentia, siccando haud appressa, subplana vel concava (non autem fornicata) late oblonga, breviter (vix ad $\frac{1}{4}$ alt.) 4-fida, dentibus lobulisve triangularibus acutis subacuminatisve, sinubus acutis, basi utrinque rotundata antice dilatata; cellulæ mediocres, quadrato-hexagonæ, fere vacuæ, pellucidæ.

Foliola vix duplo minora, patula, apice in lobos 4 brevi-subulatos fissa.

Flores dioici: ♀ postici; bracteæ intimæ foliis duplo fere longiores ovato-rotundæ apice breviter bifidulæ, margine eroso-ciliolatæ, exteriores minores apice 3–4-dentatæ.

Perianthia bracteas fere 3plo superantia, tenui-fusiformia, apice constricto 3-plicata integerrima, dimidio inferiore cellulas 2, superiore 1 c. solam crassa. Capsula brevipes oblongo-cylindrica.

L. incurvata L. et G. Syn. Hep. 203; Spec. Hep. 21, t. 4 (ab Humboldt in Nova-granata lecta) a nostra differt statura humiliore; foliis duplo minoribus paulo ultra $\frac{1}{3}$ fissis, laciniis tam incurvis ut folia primo visu "integra vel apice crenata apparent."

2. LEPIDOZIA CUPRESSINA (Sw.), var. TENUICUSPIS.

(*Lepidozia tenuicuspis* Spruce Mst.).

Hab. ad rupes arborumque radices, in montibus *Campana* et *Guayrapurina* Andium Peruvianorum, alt. circ. 1000^{m}.

F ·6 × ·5; *c* $\frac{1}{3\,5}$; f^{la} ·6 × ·5, ·4 × ·5; *br* 1·8; *per* 4·0 × ·7^{mm}. *br* ♂ ·5^{mm}.

Albescens procumbens late denseque stratificata. Caules 1–2-pollicares confertim pinnati, raro apicem versus bipinnati, ramis apice decurvis sæpeque attenuatis flagellaribus, stolonibus posticis nullis.

Folia dense imbricata incurvo-fornicata ovato-subrotunda, margine antico valde gibboso-convexa, basi subsemicordata, postico subrecta, eroso-repandula, apice paulo ultra $\frac{1}{3}$ quadrifida, sinubus subacutis, laciniis triangularibus tenui-acuminatis conniventibus, anticâ subangustiore longioreque; cellulæ parvulæ pellucidæ subæquilateræ—mediæ inferiores submajores oblongo-hexagonæ—convexulæ, pariete vix incrassato.

Foliola foliis sæpe æquimagna, oblongo-rotunda, ultra $\frac{1}{2}$ quadrifida,

sinubus obtusatis, laciniis basi late subulatis, apice capillari-cuspidatis, cuspide cellulas 6–10 uniseriatis constante.

Flores dioici: fœm. postici, sæpe fasciculati. Bracteæ intimæ foliis triplo majores, concavæ, basi mediante bracteola connatæ, ad ½ usque 4-fidæ, laciniis abrupte tenui-acuminatis, margine antico (libero) subspinosæ; pistillidia sub 20.

Perianthia bracteas plus duplo superantia, ovato-subulata incurva, superne obtuse trigona, ore ciliolata, cellulis bistratis conflata.

Amenta ♂ raro cauligena, sæpissime ramorum apice flagelliformi lateraliter insidentia, incurva circinatave; bracteæ sub 10-jugæ arctiuscule imbricatæ secundæ ovato-rotundæ concavæ ad ½ fere bifidæ, antheridiis solitariis maximis; bracteolæ duplo breviores subquadratæ breviter bifidæ.

Cel. Taylor suam *Lepidoziam tumidulam* instituit in caule bipinnato, ramis tumidis, foliis foliolisque valde concavis. Specimina originalia, ad *Cromaglown* meipso et TAYLOR lecta, folia habent densa, valde concava, caulem antice late transeuntia; foliola magna orbiculata concava, vix ad ½ quadrifida, laciniis cuspide brevi (1–4c. longa) auctis. Exempla anglica, nuperius (1881) ad *Clougha* prope *Lancaster* ab amico STABLER inventa, solum pinnata sunt, ramis persæpe apice flagellari-attenuatis; foliis autem etc. cum stirpe hibernica perfecte conveniunt. Itaque, si *L. tumidula* pro specie propria, a *L. cuprcssina* diversa habenda, nostra *L. tenuicuspis* priori magis quam posteriori sine dubio accedit. Melius autem nobis videtur omnes tres pro speciei unicæ formis s. varietatibus habendum.

3. LEPIDOZIA SUBDICHOTOMA, Spruce.

Hab. Andes Quitenses, in M. *Abitagua*, ad arborum truncos, cum *Scapania splendida*.

F ·15 × ·125; *e* $\frac{1}{55}$; *f*^{la} ·1 × ·1; *br* ·9 × ·9, 1·0 × 1·0; *per* 4·5 × ·65; *caps* 1·25 × ·5^{mm}.

Laxe cæspitosa, e pallide viridi rufescens. Caules 1–2-pollicares suberecti pendulive flexuosi pinnati; rami decurvo-subsecundi, subdichotome divisi, ramulis sæpe divergentibus, caulesque viminei rigiduli apice subattenuati non autem flagellares nec radicelliferi.

Folia distantia minuta, quadrato-subrotunda incurvo-concava ad medium 3–4 fida, laciniis suberectis subulatis subobtusis, mediis sublongioribus; cellulæ parvæ quadrato-6-gonæ subchlorophyllosæ.

Foliola distantia paulo minora subplana quadrata ad medium 4-fida, segmentis contiguis subulatis obtusis digitiformibus.

Flores dioici: ♀ postici; bracteæ 3-jugæ appressæ, intimæ foliis 6–8plo longiores orbiculatæ valde concavæ, apice 3–4-apiculatæ, margine hic illic subspinulosæ.

Perianthia alte emersa, bracteis 5plo longiora, lineari-fusiformia obtuse trigona apicem versus profunde 3-sulcata, ore constricto subintegerrima, cellularum stratis 2 conflata. Capsula 3½plo brevior, cylindrico-oblonga rufo-badia.

E foliorum minutie caules ramique primo visu denudati videntur. Species affines distinguendæ: *L. mierophylla* Hook. *foliis palmato-quadripartitis; L. patens* Ldnbg. *foliis patenti-divergentibus cuneatis quadripartitis; L. trichodes* Nees, nostrati affinissima caule arhizo et foliis inæqualiter quadrifidis (minus profunde tamen), differt caule regulariter pinnatim ramoso; bracteis longilaciniatis; perianthiis brevioribus pyramidatis; denique florescentia monoica.

4. LEPIDOZIA CÆSPITOSA, Spruce.

Hab. Ad arborum vetustarum truncos in monte *Tunguragua*, alt. 2500m, et in sylva *Canelos*.

F ·5 × ·45 ; *c* $\frac{1}{15}$; *f*^{la} ·35 × ·35 ; *br* ·8–1·0 ; *per* 4·5 × ·5mm.

Virescens humilis dense cæspitosa. Caules pollicares tenues suberecti pinnati ; rami decurvo-secundi, breviusculi, alii apice tenui flagellari ; stolones postici (perrari) foliosi ramosique, nullo aphyllo.

Folia confertiuscula, basi late patentia, supra medium incurvo-erecta, cuncato-subquadrata, basin anticam versus rotundato-dilatata, margine repandula, paulo ultra $\frac{1}{2}$ quadrifida, laciniis subæquimagnis subulatis acutis subacuminatisve ; cellulæ parvæ subopacæ, limitibus pellucidis haud incrassatis, cuticula minute tuberculosa.

Foliola perpaulo minora 4- (raro solum 3-) fida, laciniis iis foliorum subminoribus.

Flores dioici : fœm. postici. Bracteæ perianthio arcte appressæ, tristichæ, suborbiculatæ concavæ, apice breviter 2–3-fidulæ, margine hic illic spinulosæ, 4–5-jugæ, extimæ minutæ, sequuntur 3 vel 6 foliis majores, intimæ paulo minores sunt, omnes bracteæ firmæ pellucidæ rectangulari-areolatæ.

Perianthia maxima anguste fusiformi-tubulosa (9plo longiora quam lata) incurva subteretia, apice constricto solo leniter trisulca, denique breviter trifida, substantia firma, 3–4 cellulas crassa.

Pl. masc. tenuior. Amenta ramulum posticum incurvum sistentia, laxe julacea albida. Bracteæ foliis rameis æquimagnæ late orbiculatæ concavæ apice breviter bidentatæ, margine hic illic repandæ ; bracteolæ duplo angustiores ovales apice bidentatæ.

Species hæcce in m. *Tunguragua* sat frequens facie aliquantum variabilis est, nunc viridissima brevis rigidula arcte pinnata ; nunc pallida tenera ; in sylva *Canelos* longior et tenuior, muscis sæpe consociata, invenitur.

A *L. reptante* certe diversa florescentia dioica, habitu firmiore ; caule magis plumoso, flagellis posticis nullis ; foliis minoribus ultra $\frac{1}{2}$ fissis, laciniis angustioribus, *cellulis duplo fere minoribus ;* perianthiis elongatis perangustis crassioribus.

5. LEPIDOZIA DENDRITICA, Spruce.

Hab. In monte *Tunguragua*, ad arborum pedem, alt. 2500m, sterilis ; etiam in sylva *Canelos*, alt. 1500m.

F. caulina ·8 × ·7, *ramea* ·6 × ·4 ; *c*' $\frac{1}{50}$; *f*^{la} *caulina* ·6 × ·45, *ramea* ·45 × ·35mm.

Mediocris cæspitosa viridis. Caules bipollicares suberecti tripinnati dendroidei, ramis omnibus decurvulis, aliis breviusculis crassis, aliis attenuatis et valde parvifoliis.

Folia caulina subcontigua cucullato-concava valde oblique ovato-triangularia, margine antico plus duplo longiore rotundato basi integerrimo vel 1–3-spinuloso, postico recto basi spinis 1 vel 2 aucto, vix ultra $\frac{1}{3}$ quadrifida, laciniis subulatis acutis incurvis ; cellulæ parvæ. F. ramea imbricata minus asymmetrica, ad $\frac{1}{2}$ quadrifida, laciniis acuminatis porrectis, hinc vel utrinque basi subbispina.

Foliola subminora subquadrata, ad $\frac{1}{2}$ quadrifida, laciniis anguste subulatis vix acutis, basi hinc vel utrinque paucispina.

L. incurvata Ldnb. certe distat caule simpliciore, foliis distantibus subquadratis fere symmetricis, basi integerrimis; *L. truncatella* Nees. (ex Africa Australi) caule elongato laxe bipinnato, foliis omnibus imbricatis magis profunde fissis hinc solum basi subspinosis, foliolis multo minoribus; *L. cæspitosa* (nobis) statura duplo minore, foliis minus obliquis, et præcipue foliolis ultra $\frac{1}{2}$ fissis basi inermibus.

6. LEPIDOZIA MACROCOLEA, Spruce.

Hab. Andes Quitenses, ad terram et arborum truncos m^tis^ *Tunguragua.*

F ·6 × ·6, ·4 × ·4; *c* $\frac{1}{50}$–$\frac{1}{45}$; *f*^la^ ·6 × ·6, ·4 × ·4; *br* 1·5 × 1·3; *per* 6·5 × 1·0; *caps* 1·6 × ·5^mm^.

Elata saturate viridis late cæspitosa. Caules erecti tenues 1½–6 poll. apice circinati incrassati, laxe bipinnati, pinnis breviusculis pinnulisque (paucis, 1–4) pendulis.

Folia parvula, incurvo-concava, caulina dissita, ramea subimbricata, subquadrato-ovata ultra medium 4-fida, laciniis subulato-acuminatis repandis, sinubus obtusis, basi utrinque subhastatim dilatata, anticeque (raro etiam postice) spinis 1–3, sæpe hamatis, aucta, vel interdum quasi 5–6-fida; cellulæ parvæ subincrassatæ pellucidæ fere vacuæ.

Foliola foliis vix minora quadrata, magis profunde 4-fida, basi utrinque 1–3-spinosa.

Flores dioici: ♀ postici; bracteæ 3–4-jugæ, concavæ appressæ, intimæ foliis 3-plo majores ovato-orbiculares apice obsolete 4-spinæ, cætero margine hic illic denticulatæ vel subspinulosæ.

Perianthia maxima, $\frac{1}{4}$ pollicis longa, f. caulina 12plo excedentia, ovato-subulata incurva, superne profunde 3-sulca obtuse 3-gona, ore subintegerrima, substantia valida, e cellularum stratis 4 conflata, apicem versus ipsaque basi tenuiora solum 1–2 cell. crassa.

L. truncatella Nees, L. et G. Sp. Hep. no. 23, t. 8, Cap. Bonæ Spei indigena, quoad folia basi antica subspinosa nostræ affinis, minus regulariter ramosa est; foliis imbricatis ad $\frac{1}{3}$–$\frac{1}{2}$ solum fissis, laciniis latioribus; foliolis duplo minoribus solum ad $\frac{1}{2}$ usque fissis.

7. LEPIDOZIA TENUICULA, Spruce.

Hab. In M. *Tunguragua*, ad arborum truncos.

F ·5 × ·5; *c* $\frac{1}{40}$; *f*^la^ ·4 × ·35, ·3 × ·2^mm^.

Cæspitosa suberecta flaccida pallide viridis. Caules 3-pollicares tenues laxe pinnati et subbipinnati, ramis brevibus decurvulis distichis vel subsecundis.

Folia caulina dissita, oblique ovata, margine antico posticum duplo excedente basique semicordato-dilatato spina longa armato vel bispinuloso, ultra dimidium 4-fida, laciniis subulatis acuminatis acutis basi 3 (raro 4) cellulas latis; cellulæ parvulæ pellucidæ subquadratæ v. parum oblongatæ, pariete subincrassato.

Foliola foliis minora incurvula 4-fida, laciniis lineari-subulatis obtusis, utraque basi obtuse 1–2-dentata.

Folia axillaria ovata acuminata breviter bifida, segmentis subulatis conniventibus, basi utrinque bispinosa. Folia foliolaque ramea minora magis profunde fissa, laciniis solum tribus.

Huic affinis est *L. chordulifera* Tayl., longe tamen tenuior.

8. LEPIDOZIA SERPENS, Spruce.

Hab. In M. *Tunguragua* supra *Porellam arboream* repens: pl. ♂ sola observata.

F ·35 *longa*; *f^la* ·15; *c* $\frac{1}{45}$–$\frac{1}{50}$ mm.

Pusilla pallida sparsa. Caules ½-pollicares tenues vage laxe subbipinnati, prostrati, radicelliferi, flagellis nullis.

Folia dissita patenti-incurva incuba (fere transversa) cuneata, ad $\frac{3}{4}$ usque 3-fida (raro 2–4-fida), pagina basali 4c.alta, segmentis subulatis acuminatis, basi 3–4c. latis, antico longiore.

Foliola duplo breviora lato-cuneata, ultra medium 3–4-fida, segmentis subrectis basi 2c.latis.

Amenta ♂ cauligena, oblonga, virescentia; bracteæ arcte imbricatæ 5-jugæ, foliis fere majores, suborbiculatæ, breviter acute bidentatæ, concavissimæ, monandræ.

L. capillaris (Sw.) L. et G. Spec. Hep. 69, t. 11, f. 1, differt foliis majoribus, laciniis obtusiusculis basi solum 2 (raro 3) cellulas latis; foliolis folia fere æquantibus; bracteis ♂ subcomplicatis, 2–3-fidis, grosse subdenticulatis. *L. fusifera* S. folia habet imbricata, laciniis sublinearibus haud acuminatis; foliola majora ad basin fere usque 3-partita; cellulas minores.

9. LEPIDOZIA FUSIFERA, Spruce.

Hab. in declivibus umbrosis montium *Campana* et *Guayrapurina*, alt. 1000^m, in Andibus Peruvianis.

F ·25 × ·125; *c* $\frac{1}{60}$; *f^la br. inter.* 1·3 × ·75; *per* 2·4 × ·7 mm.

Pusilla depresso-cæspitosa viridis olivaceave. Caules pollicares procumbentes, basi subaphylli subdivisi radicelliferique, deinde laxe pinnati et bipinnati, intricati. Flagella postica subaphylla radicantia in medio caule raro obvia.

Folia transversa, imbricata, late patula tamen, oblonga concava 3–4-partita (limbo basali integro 2–3 cellulas alto); laciniis linearisubulatis, 7–10 cell. longis, 2 cell. (apice 1 solam cellulam) latis, anticâ tamen cæteris angustiore divergenti-erectâ; cellulæ minutulæ quadratæ, pariete validiusculo, intus ambitu opacæ.

Foliola subminora, angustiora, ad basin fere usque 3-(raro 2-)partita; laciniis capillaceis erectis appressis, cellulis 8 vel paucioribus uniseriatis constantibus.

Flores dioici: ♀ ramulo proprio postico constantes. Bracteæ sub 3-jugæ, magnæ, intimæ foliis 5plo longiores, ovatæ concavæ appressæ, apice recurvulo subacuminato brevissime 2–3-fidæ, margine subdenticulatæ.

Perianthia bracteas duplo superantia, e cellulis rectangulari-oblongis unistratis conflata, superne obtuse trigona et tri-vel sexsulca, ore sensim constricto plurilaciniata, laciniis subulato-attenuatis flexuosis.

Amenta ♂ ramulo postico incurvo constantia; bracteæ 5–10-jugæ, foliis paulo minores, confertæ, assurgenti-secundæ, ovatæ concavæ bilobæ—rarius apice inæqualiter 4-dentatæ—basi antica bispinosæ, antheridia magna solitaria in gremio foventes. Bracteolæ parvæ deciduæ.

L. capillaris Sw., foliis minus profunde (solum ad ½–$\frac{3}{4}$) fissis, laciniis strictionibus; foliolis 3-vel sæpe 4-partitis, laciniis lanceolato-subulatis; bracteis apice laciniato-ciliatis; perianthiis minus longe ciliatis, diversa.—*L. granatensis*, Gottsche in Hep. Novogranat. 45, subaffinis, differt

florescentia monoica; ramificatione vaga; foliis solum 2–3-partitis, laciniis lanceolatis; etc.

Obs. In consequence of the exactly transversal insertion of the leaves, and their concavity, they are in reality neither succubous nor incubous. Each leaf lies partly over and partly under the next upper leaf, when the stem or branch is laid flat; but stands exactly underneath it (like one cup under another) when the stem or branch is set upright.

10. LEPIDOZIA AMAZONICA, Spruce.

Hab. in solo rubro subquarzoso, sub fruticum umbra, ad *Manâos*, fl. *Negro* ostiis proxima: rara et solum sterilis.

F ·15; *c* $\frac{1}{60}$; *f*^{la} ·08^{mm}.

Minuta badia prostrata intricata. Caules $\frac{1}{3}$-pollicares pauciramei—raro subpinnati, basi rhizomatosi flexuosi divisi subaphylli interdum postice flagelliferi; rami laterales basi subnudi.

Folia transversa confertiuscula, late patentia tamen, apice incurvula, cuneata 3-partita; cruribus subulatis obtusis, 2 lateralibus majoribus dimidio infero 2 cellulas, supero 1 cellulam latis, crure antico breviore et angustiore cauli parallelo et subappresso; cellulæ minutulæ rectangulares vel subquadratæ tuberculis asperatæ. Limbus folii basalis ad crura longiora 2 cellulas, antice tamen 1 cellulam solam, latus; crura lateralia 6–7cell. longa.

Foliola duplo breviora caule velata, bipartita, cruribus 1 cell. latis, altero duplo fere breviore. Rhizina vix ulla nisi pauca ad caulis basin rhizomatosam.

Obs. The underleaves are contiguous at the base, on the side of the longer segment, to the adjacent leaf, but distant from the leaf on the opposite side of the stem. *L. capillaris* Sw. has the leaves three times as long, less deeply cloven, and (like the underleaves) often 4-cleft; besides, like nearly all other tropical *Lepidoziæ*, it is a mountain plant. *L. amazonica* is the only species known to me which descends very nearly to the sea-level within the tropics. It is scarcely necessary to add that our *L. setacea* seems abundantly distinct in the pinnate or bipinnate stems, the less deeply cloven leaves (only to within 3–5 cells of the base), the segments wider upwards, and the symmetrical 3-4-cleft underleaves.

11. LEPIDOZIA CHÆTOPHYLLA, Spruce.

Telaranea chætophylla Spruce Mst nov. gen.

Hab. in terra nuda humida sylvarum, rarius in truncis putridis, secus fluvios *Negro*, *Casiquiari*, *Aripecurâ*, etc.; in Andibus Peruvianis rarior est, et in montibus *Cumpana*, etc. vix supra 1500^{m} alt. ascendit; in m. *Tunguragua* et *Chimborazo* Andium Quitensium alt. 2500^{m} attingit.

F ·25—·4^{mm} *longa*; *c* $\frac{1}{16}$; *f*^{la} ·1–·2; *br. int.* 1·0; *per* 1·5 × ·5; *caps* ·5 × ·3^{mm}.

Pusilla, e viridi albescens cinereave, pellucida, prostrata intricata. Caules repentes, pollicares, sat validi, compressuli, strato corticali cellulis 8–10-seriatis magnis oblongis convexulis pellucidis, nucleo cellulis pluriseriatis multo angustioribus subopacis (7 in caulis diametro longiore, 4–5 in breviore) constante, vage, vel in cæspitis ambitu pinnatim ramosi; rami breves laterales, rarissime adveniunt etiam

postici, simplices vel interdum subdivisi, foliosi [flagellis aphyllis terraque radicantibus nullis].

Folia transversalia, dissita, ad basin usque 3-partita, ramea subcontigua vel etiam conferta 2–3-partita; crura infimâ basi ad cellularum basalium $\frac{1}{3}$ altitudinem solum connata, setacea, recta divergentiave, cellulis uniseriatis (vel ipsa basi biseriatis) constantia; cellulæ majusculæ cylindricæ, vix duplo longiores quam latæ, sublævissimæ, chlorophyllo parcissimo demum ad cellulæ extremitates coacervato. F. axillaria (quæ sc. rami axillam obtendunt) prælonga, semper fere unicrura, subulato-setacea.

Foliola latitudine caulis, dimidia longitudine foliorum, vel minora, 2–(raro 3-) partita, cruribus erecto-incurvis cellulis tribus constantibus setaceis, basi radicellifera.

Flores monoici: ♀ ramo brevi postico constantes, innovatione nulla suffulti. Bracteæ 3–5-seriatæ, tristichæ; intimæ foliis triplo majores, 3–5-partitæ; crura basi in limbum 2 vel 3 cellulas altum coalita, deinde subulata, inferne 2 vel 3 cellulas, superne 1 solam cellulam lata, vel laciniato-ciliata, vel bi-trifurca, vel solum basi unidentata.

Perianthia magna, foliis 4–6-plo longiora, fusiformi-subulata, inferne subteretia, supra medium obtuse trigona et triplicata, ore constricto longiciliata, ciliis 12–18. Calyptra duplo brevior, tenuis ovalis, basi et paulo altius pistillidiis sterilibus (sub 9) obsita, demum bilabiatim rupta. Capsula magna subcylindrico-oblonga nigro-purpurea, ab ipsa basi 4-valvis. Elateres longiusculi bispiri utrinque attenuati. Sporæ minutæ læves diametro elaterum latitudinem æquantes.

Amenta ♂ ramum lateralem totum, vel sæpius ejus apicem solum tenentia; bracteæ sub 5-jugæ, monandræ, assurgenti-conniventes, cæterum foliis vix diversæ.

Obs. Folia insertione revera transversa, nihilominus quoad imbricationem potius "succuba" quam "incuba" dicenda.

Lepidozia nematodes (Gottsch. sub *Jungermania*, in Wright's 'Hepaticæ Cubenses'—haud *L. nemoides* Tayl., L. et Gottsch. Spec. Hep. tab 10)—nostræ valde affinis, diversa videtur flacciditate; caule tereti 4–5-cell. lato; foliolis minutis solum 2c. longis; perianthio majore, superne dilatato, ore 24-ciliato.

Species istæ ad *Arachniopsin* nostram accedunt, quoad habitum filamentosum, &c., fereque pro genere proprio (*Telaranea* nob. herb.) habendæ. Differt *Arachniopsis* ramis omnibus posticis, foliorum cruribus inter se omnino liberis—interdum solitariis—foliolis nullis; itaque ad *Cephaloziam* proxime accedit, dum *Telaranea* a *Lepidozia* ægrius separanda.

XIII. BAZZANIA, Gray.

Nat. Arr. Brit. pl. (1821). *Pleuroschisma* Dum. Recueil. (1835). *Mastigobryum* Nees. Syn. Hep. (1845).

Caulis validus subteres, a fronte compressulus, iteratim furcatus (dichotomus), angulo furcæ—in una et eadem specie sat constante—inter 30° et 100° ludente, sæpe recto, vel plus minus acuto, raro obtuso (in *B. divaricata*, e. g.). *Rami* postici vel brevissimi et floriferi, vel sæpe prælongi microphylli et radicellosi. *Cellulæ*

caulis pluristratæ, corticales internis conformes, magis opacæ, iis foliorum inferioribus sat similes nisi subminores. *Folia* incuba, alterna, in paucis opposita, basi plus minus imbricata, apice pro m. dissita, decurva, interdum (in sicco præcipue) secunda, semper obliqua, plerumque falcata, subduplo longiora quam lata, a basi semicordato-ovata sensim angustata, in dimidio supero subligulata, apice plano semper fere truncato-tridentata—casu rariore 4-dentata vel subintegra—in perpaucis æqualiter bidentata, vel (in aliis speciebus) inæqualiter biloba; margine in plerisque integerrimo, in paucis basi postica spinoso dentatove. Axis folii margini postico propior, vittâ cellularum majorum elongatarum, in seriebus 6–12-dispositarum, notata; cæteræ cellulæ parvæ subæquilateræ guttulatæ, plerumque sublævissimæ, pariete ad angulos insigniter incrassato. *Folium dichotomiale* anticum, cæteris longius, ovato-subulatum integrum. *Foliola* ubique præsentia, foliis subduplo—raro 3–4-plo—breviora, caule sat latiora, appressa, plerumque subrotundo-quadrata, raro longiora, apice truncato persæpe 4-crenata-incisulave, raro subintegerrima, margine integerrima vel subdentata; in aliis speciebus basi cordata, auriculis interdum spinis armatis. *Flagella* subæquifoliata; folia minuta tristicha ovata concava, apice bidentula, rarius solum apiculata tridentulave, juxta basin radicellas longas pallidas proferentia. *Flores* dioici, utriusque sexus cladogeni, ramulis posticis constantes. *Bracteæ* ♀ 3–5-jugæ, intimæ majores (foliis autem sæpe subbreviores) arcte imbricatæ concavæ, orbiculatæ ovatæve, rarius ovato-lanceolatæ, apice saltem lobulatæ, laciniatæ, ciliatæve, subscariosæ, cellulis majusculis elongatis 4–6-gonis subvacuis constantes. *Pistillidia* 10–16. *Perianthia* ovato-subulata fusiformiave, 3–4-plo longiora quam lata præter ad basin subcarnosam leptodermia, primum ab ipsa basi tricarinata, carinis latis, sulca exaratis, exinde quasi 6-plicata, posterius—fructu maturato repleta, carinisque fere obliteratis—interdum subteretia, solum apice constricto trigona; ore in statu perfectiore ciliis longis, 12–15, penicellata. *Calyptra* perianthio duplo brevior pyriformis vel cylindrico-oblonga, basi quasi-stipitata 3-strata, pistillidiis sterilibus obsita, superne 2-strata. *Capsula* calyptra duplo brevior, oblonga, subcylindrica, sub 5-strata; cellulæ stratorum 4 exteriorum columnis parietalibus fulcitæ, extimi duplo majores tesselatæ, intimi (quinti) fibris semiannularibus notatæ. *Elateres* tenues subobtusi, sporis minutis duplo angustiores. *Amenta* ♂ folio postico axillaria, brevia incurva; *bracteæ* 5-raro ad 10-jugæ, ovatæ concavæ vel subcom-

plicato-convolutæ, apice truncatæ, bifidæ, bispinosæve, raro integræ; *antheridia* bina longistipitata, raro solitaria.

Hab. Loca umbrosa, in sylvis montium præcipue, ad saxa, arborum truncos et ramos, necnon in truncis prostratis et putrescentibus, rarius in ipsa terra, plagas prælatas sistens, sæpe super alias hepaticas muscosque flagellis suis validis radicantibus reptans.

Distr. Per orbem terrarum; in zona temperata boreali speciebus solum 2 (ut videtur) constans; inter tropicos et in zona temperata australi, in Australasia præ aliis, formæ numerosissimæ—forsan ad species sane haud permultas referendæ—inventæ sunt. Ipse in sylvis Andium et flum. Amazonum species circiter 19 legi.

Obs. Folia nunquam (ad *Micropterygii* instar) complicata, margine postico autem (nisi ipsa basi, ubi recurvula) leniter incurvula. In speciebus foliis apice inæqualiter bifidulis donatis (sc. *B. anisostoma*, *inæquilatera*, &c.) hæc incurvatio tali modo augetur ut folia canaliculata evadunt, itaque ad *Micropterygium* sensim accedunt.

The species of this genus are a standing puzzle to hepaticologists. They are all so alike in habit and in their more obvious characters that a casual observer would unhesitatingly refer them to the same genus; but when we try to define the species, we find it difficult to assign them positive limits. Out of the wealth of material I amassed in the forests of the Amazon and Andes I could easily frame double the number of "species" here recorded. The forms I have grouped under the name *Bazzania bidens*, for instance, might seem to other observers equivalent to 3 or 4 distinct species; but when I find West Indian forms differing slightly from all these, but (like them) showing no character that I could account specific, I have concluded to let them stand as varieties of a single species. —Several Oriental species with opposite leaves are known, but only a single American, *B. Peruviana* (Nees), which, singularly enough, I never gathered, nor have I been able to see a genuine specimen of it.

§ 1. *Folia apice bidentata.*

1. *B. bidens* (L. et L.) Subpusilla flavida rufulave. Folia parvula laxiuscula semiovato-lanceolata linearíave, dentibus apicis breviusculis acutis. F^{la} 4 plo breviora subquadrata, apice 4-crenata-denticulatave, interdum subintegra. Per. tenuia, tota longitudine trigona, ore ciliolata—Var. *vittata* S. Folia breviora semiovata, cellulis mediis discoloribus distincte vittata.—Var. ? *dissodonta* S. F. semiovato-ligulata, dentibus longis acuminatis. F^{la} solum duplo breviora, apice grosse 4-dentata, vel 4-fida, margine interdum utrinque 1–2-spina. [Potius species propria.]—Var. *heterodonta* S. F. tridentata cum aliis normaliter bidentatis admixta. F^{la} sursum crescentia, superiora late cuneato-quadrata longidentata.

§ 2. *Folia apice tridentata, raro etiam in eadem stirpe* 2-*vel* 4-*dentata, rarissime* (*e dentibus lateralibus obsoletis*) *apice subintegra.*

A. Foliola parva, foliis 2–5*plo minora, basi haud* (*vel vix*) *cordata. F. basi integerrima.*

2. *B. phyllobola* S. Pusilla tenuis parce divergenti-dichotoma, e foliis caducis pro p. nuda. F. parvula distantia ligulata, apice tribidentata, d. acutis; c. subæquimagnæ. F^{la} foliis 4plo breviora, apice subtridenticulata. Br. interiores foliis longe majores, apice profunde 3–4-laciniatæ. Per. paulo emersa, ovato-fusiforma, a basi ipsa fere trigona, ore 6-plicato breviciliato. Br. ♂ monandræ.
3. *B. decidua* S. Mediocris tenuis parce et acute dichotoma. F. distantia caduca, semiovato-trapezoidea, apice argute tridentata; c. medianæ lateralibus paulo majores. F^{la} duplo minora quadrato-oblonga, apice crenulata. Br. intimæ foliis breviores, apice 2–3-ciliolatæ.
4. *B. diversicuspis* S. Mediocris parce dichotoma. F. majuscula subimbricata subfalcata semiovato-lingulata subvittata, apice vel acuta (unidentata) vel subtridentata. F^{la} 3–4plo breviora quadrata, retusa vel obsolete crenulata.
5. *B. brasiliensis* (N.). Mediocris, flavida vel virescens. F. subimbricata subfalcata oblique ovato-ligulata evittata, apice profunde 3-dentata, d. subacuminatis. F^{la} triplo minora, quadrata, apice truncato mutica vel 4–6-denticulata. Br. intimæ apice 2–3-(media 4-) laciniatæ. Per. ovato-subulata trigona.
6. *B. aurescens* S. Mediocris viridi-aurea. F. subcontigua oblique obcuneato-ligulata subfalcata evittata, apice trifida, segmentis angustis cuspidulatis. F^{la} $2\frac{1}{2}$plo breviora cuneata, apice sub 4-crenata, utroque margine 2–3-crenata.
7. *B. leptostipa* S. Majuscula fulva acute dichotoma. F. (decidua) magna contigua subfalcata, apice 3-dentata, d. brevibus peracutis, basi antica $\frac{1}{2}$ caulem imbricantia. F^{la} vix triplo minora, appressa *tenuissima* quadrato-oblonga, apice vix crenulata. Br. foliis subæquilongæ, intimæ ovato-lanceolatæ, apice trilaciniatæ. Per. 5plo longiora quam lata, anguste ovato-fusiformia, trigona, apice constricto sexfida.
8. *B. viridissima* S. Robusta iteratim divaricato-dichotoma. F. magna imbricata falcata longe semicordato-ovato-ligulata, apice argute 3–4-dentata, d. triangularibus peracutis, medio submajore, basi antica caulem transeuntia. F^{la} triplo fere minora, rotundo-quadrata, apice irregulariter 3–4-crenata, basi vix subcordata, vel semicordata.
9. *B. teretiuscula* (L. et G.) Mediocris stratificata fulva anguste dichotoma (angulo 20°–40°); ramis apice hamatis, in sicco e foliis devolutis teretiusculis. F. majuscula subimbricata subfalcata semicordato-ovato-lanceolata, apice breviter 2–3-dentata, raro 1-dentata, basi caulem obtegentia. F^{la} dimidio folio subminora, quadrato-oblonga, apice sub 4-crenata.
10. *B. planiuscula* (G. et L.) Mediocris fuscidula subdichotoma. F. sat magna subimbricata divergentia subfalcata semicordato-ligulata, apice argute trifida, d. anguste triangularibus peracutis, interdum denticulo armatis. F^{la} $\frac{1}{2}$ folio subminora, quadrato-oblonga, apice truncato 4-crenata.
11. *B. Chimborazensis* S. Elata flavo-viridis laxe stratificata, angulo vix recto dichotoma. F. magna subimbricata falcata, semicordato-ovato-oblonga, margine supero subdenticulata, apice serrato-3-dentata, d. breviusculis apiculatis; c. mediæ pluriseriatæ pallidæ, cæteris duplo majores. F^{la} plus duplo breviora quadrato-rotunda, basi breviter subcordata, toto margine varie crenata erosulaque.

B. *Foliola magna, foliis solum (vel vix) duplo breviora, basi biauriculato-cordata.*

b. *Auriculæ foliolorum pro m. inermes. F. basi plerumque inermia, in paucis subdentata.*

12. *B. flavicans* S. Mediocris tenera parce dichotoma. F. magna subimbricata ovato-ligulata, apice trifidula, d. triangularibus, supero longiore, basi antica caulem subtranseuntia, postica crispula; c. mediæ lateralibus sensim duplo et ultra majores, trigonis maximis. F^{la} duplo breviora, apice obsolete 3–4-crenata, basi breviter cordata.
13. B. Vincentina (L. et L.) Elata fulva vel olivaceo-viridis pluries dichotoma stratificata. F. magna parum falcata semicordato-ovato-ligulata, apice tridentata, d. brevibus subapiculatis, medio dente multo majore; basi antica caulem transeuntia, postica crispula, axin versus cellulis elongatis vittata. F^{la} duplo breviora suborbiculata, toto margine late crenata, auriculis baseos majusculis oblongis. Br. int. foliis sat breviores. Per. plus minus emersa fusiformia, apice ciliata.—Var. *macrophylla* S. foliis prælongis (3^{mm}), per. maximis (4×1^{mm}).—Var. *submutica* S. foliis apice vel triangularibus vel truncatis et obsolete dentatis.
14. *B. robusta* S. Elata rigida dense stratificata iteratim dichotoma crebre flagellifera. F. magna confertissima, recentia et sicca decurvo-secunda, falcata, oblique cordato-lingulata, apice angusto 3-(4-) dentata, sinubus rotundatis, dentibus acutissimis subinde denticulatis; basi antica caulem obtegentia, postica crispula et eroso-denticulata. F^{la} triplo fere breviora, oblato-orbiculata, toto margine crenulato-repanda, auriculis subrotundis crispulis. Per. semiemersa ovato-subulata ore longiciliata.
15. *B. heteroclada* S. Elata albido-viridis stratificata, caule tenuiusculo peranguste dichotomo, stolones posticos foliosos et ramulosos—rarius flagellares—edens. F. magna conferta secunda valde falcata, e basi ovali triangulari-ligulata, basi antica caulem obtegentia, postica dilatata 2–4-spina denticulatave, apice grosse 3-dentata, d. acutis. F^{la} duplo minora quadrato-oblonga, apice breviter 4-fida, auriculis baseos planis decurrentibus.
16. *B. humifusa* S. Mediocris rufula reptans subacute dichotoma. F. majuscula subimbricata longe semicordato-triangularia apice argute 3-dentata, d. lato-subulatis subapiculatis, basi antica caulem obtegentia, medio lativittata, trigonis cellularum maximis. F^{la} duplo minora subquadrata, apice 4-crenata, auriculis baseos rotundo-oblongis falcato-conniventibus.

b_2. *Auriculæ foliolorum spinosæ. Folia basi spinis armata.*

17. *B. ancistrodes* S. Mediocris rufula dense stratificata iteratim dichotoma. F. imbricata, valde oblique ovato-ligulata, falcata, apice breviter 3-dentata, dentibus acutis (altero sæpe obsoleto), basi antica caulem transeuntia, postica longe decurrente 2–3-spina. F^{la} duplo breviora rectangulari-oblonga, apice subcrenulata, auriculis baseos magnis falcato-conniventibus paucispinis.
18. *B. spinigera* S. Humilis pallida fragilis subdichotoma. F. majuscula arcte imbricata cordato-ovato-ligulata, valde gibboso-falcata et inæquilatera, apice 3–4-dentata, d. patulis peracutis, basi antica caulem vix obtegentia, postica dilatata subspinosa ciliataque. F^{la} $\frac{1}{2}$ folio

majora ovato-oblonga, apice rotundato-truncato varie dentata, basi profunde cordata spinosa.

19. *B. acanthostipa* S. Elata flavida semel bisve furcata. F. subimbricata tenera distiche patula subfalcata, valde oblique semicordato-ovato-ligulata, basi antica caulem transeuntia, postica ampliata 4-spina. F^{la} $2\frac{1}{2}$plo breviora, cordato-quadrata 4-crenata, utroque margine 1-2-dentata, auriculis baseos conniventibus crispis 2–4-spinis.

1. BAZZANIA BIDENS Gottsch. et Lindenb.

Mastigobryum bidens, G. et L. Spec. Hepat. 87, t. 15.

Hab. Panuré fluvii *Uaupés; Manáos* et *San Carlos* fluvii *Negro; Pará* flum. Amazonum; etiam (var. *vittata*) in sylvis occidentalibus montis *Chimborazo*. In truncis vetustis cariosisve et in terra arenosa umbrosa viget. E Guiana Gallica habuerunt Montagne et Lindenberg.

F ·85 × ·38 (*apice* × ·15); c $\frac{1}{28}$–$\frac{1}{40}$; f^{la} ·2 × ·25, ·18 × ·18; *br. intimæ* 1·1 × ·55; *per* 2·5 × ·65^{mm}.

Tenuis, flavida rufulave, in plagas latas tenues prostrata. Caules 2–3-pollicares flexuosi, crebre flagelliferi, parum dichotomi, angulo dichotomiali subdivergente.

Folia parvula alterna subcontigua vel subimbricata, subdeflexa parum falcata, semiovato-lanceolata-linearivave, repanda, apice angustiusculo subacute bidentata, dentibus peracutis suberectis, margine postico fere recto, antico basi rotundato caulem vero haud obtegente; cellulæ pellucidæ (trigonis magnis) mediæ paulo majores vix tamen vittam efformantes.

Foliola distantia, foliis plus 4plo breviora, caule haud latiora, subquadrata, apice plus minus 4-crenata-denticulatave, dentibus haud raro obsoletis.

Flores dioici: Bracteæ ♀ paleaceæ appressæ 3–4-jugæ, concavæ, laxe areolatæ; extimæ minutæ subrotundæ, laterales bi-(media 3-)dentatæ; interiores majores ovatæ apice extimis conformes; intimæ f.caulinis longiores ovato-oblongæ, laterales apice bilaciniatæ, media (major!) trilaciniata, lacinulis lateralibus sæpe adjectis, cætero margine subdenticulato.

Perianthia foliis triplo longiora, anguste ovato-fusiformia unistrata, ab ipsa basi trigona, apice breviter lacinulato-ciliata. Calyptra solum basi tubulari subcarnosa, cæterum tenuis. Capsula anguste oblonga.

Andrœcia spiculas posticas incurvas pallidas, solitarias binasve, sistentes; bracteæ sub 5-jugæ concavæ, apice bifidæ, segmentis bidentellis vel iterum bifidis. Antheridia solitaria, rarius bina. Bracteolæ perangustæ oblongæ truncatæ, superne subcrenulatæ.

Var. *vittata*, foliis brevibus semiovatis, distincte vittatis, vittâ cellulis majoribus flavidis 5–6-seriatis constante, paulo ante apicem evanescente, foliolis parvis appressis obsolete dentatis. In M. *Chimborazo*, cum *B. Chimborazensi* mixta. Ad *B. divaricatam* N. (Sp. Hep. Mastig. t. 5) accedit.

Var. *dissodonta* S. (*Bazzania dissodonta* Spruce in Mst.).

Folia subfalcata semiovato-ligulata longius bidentata, dentibus triangularibus acuminato-acutis. Foliola duplo majora quam in *B. bidente* typico, apice grosse 4-dentata, quasi bis bifidula, interdum ad medium fere usque 4-fida (raro solum 3-dentata), dentibus sub-

acuminatis, margine utrinque 1–2-spina nudave. Folia sæpissime decurvo-secunda rigidula persistentia, quando autem subexplanata inveniuntur tunc valde caduca. In M. *Campana* Andium Peruvianorum. (F^{la} ·4 × ·35^{mm}).

Var. *heterodonta* S. A priori quoad folia—nisi rarissime tridentata—vix differt; foliola tamen caulis apicem versus sensim crescunt, superiora late cuneato-quadrata longidentata. In M. *Guayrapurina* Andium Peruvianorum.

Obs. Figura *Mastigobryi bidentis*, in Spec. Hep. t. xv, folia monstrat paulo longiora quam in nostra (typica) sine aliis differentiis. Forma longifolia quoque in insula Guadalupa legit. cl. Husnot.

2. BAZZANIA PHYLLOBOLA, Spruce.

Hab. in M. *Guayrapurina* Andium Peruviæ, ad arborum radices.

F ·9 × ·3, ·9 × ·35; *c* $\frac{1}{30}$—$\frac{1}{4}$; f^{la} ·2 × ·2; *br* 1·5 × ·75; *per* 2·0 × ·8^{mm}.

Pusilla laxe stratificata fuscidula. *Caules* 2–3-pollicares intricati tenues flexuosi parce dichotomi (angulo lato) flagelliferi, e foliis caducissimis sæpe fere denudati.

Folia distantia late patentia parum decurvula suboblique ligulata, apice truncato (interdum sublatiore quam basis!) tri-bidentata, dentibus subæqualibus acutis, sinubus subacutis; *cellulæ* parvæ subæquimagnæ quadrato-hexagonæ, pariete parum incrassato.

Foliola plus 4plo breviora, distantia, cauli æquilata appressa, rotundo-quadrata, apice subtridenticulata.

Flores dioici: ♀ postici. Bracteæ paleaceæ tenuissimæ arcte appressæ, *intimæ foliis longe majores* ovatæ acuminatæ *complicato-concavæ*, apice in lacinias 3–4 prælongas erectas dissolutæ, margine subdenticulatæ.

Perianthia emersa tenuia, foliis caulinis plus duplo longiora ovato-fusiformia, a basi fere obtuse trigona, ore constricto 6-plicato breviciliata, demum plurilaciniata. Calyptra carnosa, paulo supra basin 3 cell. crassa.

Amenta ♂ foliis lateralibus sublongiora julaceo-trigona incurva; bracteæ prælate ovatæ convoluto-concavæ, apice anguste truncato 4– (3-) dentatæ, subinde bis bifidulæ, *antheridia solitaria* magna foventes; bracteolæ minores trifidæ vacuæ.

Forma foliorum, apice (nec basi) magis lata, et foliolis duplo minoribus a *B. dissodonta* facile distincta species.

3. BAZZANIA DECIDUA, Spruce.

Hab. in monte *Tunguragua*, ad arborum truncos.

F 1·0 × ·6; *c. mediæ* $\frac{1}{35}$, *laterales* $\frac{1}{45}$; f^{la} ·5 × ·4; *br. int.* ·75 × ·35^{mm}.

Cæspites magni rufo-badii, apice virescentes. Caules 3–4-pollicares tenues parce dichotomi, angulo furcarum acuto, sub 45°.

Folia deciduissima distantia, decurvula dimidiato-ovato-trapezoidea, haud falcata, basi antica subsemicordata caulem haud obtegentia, apice oblique truncato acute tridentata, dentibus acutis inæqualibus, antico sæpius majore; cellulæ subconformes (medianæ perpaulo majores) subæquilateræ, subpellucidæ, ad angulos præcipue incrassatæ.

Foliola dissita, quadrato-oblonga, foliis duplo minora, apice obscure 3–4-crenulata vel solum repando-retusa.

Flores dioici: ♀ ovato-fusiformes. Bracteæ sub 9, arcte appressæ,

intimæ foliis $\frac{1}{4}$ breviores, ovato-lanceolatæ concavæ, apice 2–3-ciliolatæ vel bifidulæ; cellulæ majusculæ rectangulari-4–5-v. 6-gonæ, vacuæ. Cætera haud visa.

Cum hac congruit *B. phyllobola* S. quoad folia decidua, differt autem foliis duplo angustioribus, basi haud cordatis; foliolis plus duplo minoribus; bracteis duplo *majoribus*. *B. tridens* Nees. distincta est foliis subimbricatis brevidentatis et foliolis minutis.

4. BAZZANIA DIVERSICUSPIS, Spruce.

Hab. *Tauaú*, prope *Pará*, supra filices repens.

F 1·6 × ·7, 1·3 × ·65; *c* $\frac{1}{25}$–$\frac{1}{50}$; *f*^{la} ·4 × ·4, ·4 × ·35^{mm}.

Viridis, prostrata, laxa; caules 2-3-pollicares nigrescentes parce dichotomi, flagelliferi.

Folia subdecidua subimbricata decurva *subfalcata* oblique semiovato-lingulata *apice abrupte acuta* v. *subtridenticulata*, dentibus lateralibus subobsoletis, *raro rotundata*, basi antica vix semicordata caulem subobtegentia, margine postico concavo; cellulæ subincrassatæ, subpellucidæ (ambitu interno subopacæ), medianæ a basi ad dimidium folium duplo majores subelongatæ vittam indistinctam efformantes.

Foliola 3–4-plo breviora, quadrata, vel quadrato-oblonga, retusa v. obsolete 3–4-crenulata, basi hinc cum folii basi contigua (vix connata).

B. tenera L. et G., quoad foliorum apicem diversiformem nostræ similis, certe diversa erit foliis multo minoribus brevioribusque. Cf. Spec. Hep. 71, t. 13.

5. BAZZANIA BRASILIENSIS (Nees).

Mastigobryum brasiliense G. et Lindenb. Sp. Hep. 85 t. 15.

Hab. in Brasilia media et australi (MARTIUS). In sylva Amazonica haud infrequens, secus fluvios *Negro* et *Uaupés* præcipue (R.S. 1849–1855); perianthia autem rarissima.

F 1·6 × ·6 (× ·3–·35 *apice*); *c* $\frac{1}{25}$–$\frac{1}{35}$; *f*^{la} ·5 × ·4, ·5 × ·45^{mm}.

Mediocris, flavida vel virescens, strato tenui procumbens. *Caules* 2–3-pollicares dichotomi; flagella creberrima, foliis minutis ovatis ovato-lanceolatisve integris apiceve 2–3-dentatis tristichis distantibus vestita, apice subaphyllo radicantia. Raro advenit ramus posticus furcatus normaliter foliosus.

Folia subimbricata decurvula oblique ovato-ligulata subfalcata, utroque margine (basi anticâ rotundatâ dimidium caulem obtegente exceptâ) fere recta, repandula, evittata, apice oblique truncato profunde 3-(raro 4-) dentata, dentibus acutis subacuminatis, sinubus acutis obtusisve; cellulæ mediocres pellucidæ incrassatæ, medianæ perpaulo sensimque majores subelongatæ.

Foliola triplo minora, contigua vel subimbricata, quadrata vel oblongo-quadrata, apice truncato vel mutica, vel 4-crenata-denticulatave, vel 6-denticulata, denticulis alternis minoribus.

Flores dioici: ♀ ramulo brevi postico sistentes. Bracteæ 4–5-jugæ appressæ ovatæ 2–3-fidæ, laciniis subulatis, subciliolatæ; bracteola intima bis bifida vel plurilaciniata, laciniis ciliiformibus.

Perianthium emersum ovato-subulatum, subfusiforme, trigonum (apice in specimine jam disruptum). Calyptra inferne 2 v. 3 cellulas crassa, apice tenuis.

6. BAZZANIA AURESCENS Spruce.

Hab. in declivibus saxosis umbrosis montis *Guayrapurina* Andium Peruvianorum.

F 1·6 × ·65 (*apice* × ·3 –·35); *c* $\frac{1}{40}$–$\frac{1}{25}$; f^{la} ·65 × ·65^{mm}.

Mediocris, viridi-aurea, cæspitosa-stratificata. Caules tenues rufi flexuosi parum et subacute dichotomi.

Folia contigua vel basi sola imbricatula, angulo fere recto divergentia, oblique obcuneato-ligulata, paululum falcata et decurvula, apice truncato trifida, dentibus rectis anguste triangularibus cuspidulatis, raro subdenticulatis, medio sæpe submajore, basi antica rotundata (haud semicordata) $\frac{1}{2}$ caulem velantia, margine repandula, basi postica vix subampliata, medio evittata; cellulæ concolores subpellucidæ valide incrassatæ, mediæ lateralibus sensim paulo majores, omnes guttulatæ et quasi-moniliatæ.

Foliola dissita foliis 2$\frac{1}{2}$plo breviora, cuneata vel late cuneato-quadrata—subinde subrotunda—apice truncato sub 4-crenata, crenulis rotundatis sæpeque apiculatis, margine utrinque grosse 2–3-crenata, basi excisa raro hinc deorsum in dentem producta.

A *B. brasiliensi*, cui proxima, distat foliis sparsioribus, dentibus longioribus cuspidulatis; foliolis submajoribus, utroque latere grosse crenatis; crenulis apicis magnis plerumque apiculatis.

B. humifusa S. foliis eadem longitudine, apice in dentes 3 longos fissis, *B. aurescente* congruit; differt tamen foliis basi amplioribus, antice caulem obtegentibus, vittatis; foliolis submajoribus basi cordato-biauriculatis, margine laterali haud crenatis.

Obs. The trigones at the angles of the cells are sometimes almost as large as the cells themselves; and the lumen (or cavity) of each cell being subcontiguous to that of the cell at each end of it, but widely separated from the lumen of the collateral cells, causes the cells to resemble strings of minute oblong pearls, alternating with rows of smaller, angular and yellowish beads (the trigones).

7. BAZZANIA LEPTOSTIPA Spruce.

Hab. In M. *Chimborazo*, in eodem cæspite ac *B. Chimborazensis* S.

F 2·0 × 1·0, *c* $\frac{1}{20}$, $\frac{1}{25}$, $\frac{1}{45}$, f^{la} ·75 × ·65, *br* 2·0 × 1·0 *per* 4·0 × 0·8^{mm}.

Fulva, laxe stratificata, pendula; caules 2–3-pollicares badii acute dichotomi flagelliferi, sæpe ob folia decidua *ex parte denudati*.

Folia decidua, contigua, perpaulo imbricata, subdivergentia, patula v. decurvo-subsecunda, subfalcata, oblique ovato-ligulata, apice truncato 3-dentata, *dentibus brevibus* peracutis v. apiculatis, sinubus plerumque obtusis, basi anticâ vix semicordata $\frac{1}{2}$ caulem imbricantia, posticâ vix dilatata *decurrentia;* cellulæ subpellucidæ incrassatæ, interiores pluriseriatæ sensim multo majores, concolores tamen nec vittam discolorem efformantes.

Foliola subdissita *appressa tenuissima*, foliis vix 3plo breviora; quadrato-oblonga apice truncato vix obscure crenulata basi utrinque brevissime decurrentia, cellulis tenuibus oblongis reticulata.

Flores dioici: ♀ postici, bracteæ suberectæ concavæ, intimæ foliis æquilongæ v. subbreviores, ovato-lanceolatæ, tenues, rectangulari-reticulatæ, apice trifidæ, *segmentis tenui-subulatis.*

Perianthia foliis subduplo longiora, 5plo longiora quam lata, anguste

ovato-fusiformia, trigona (demum, fructu repleta, fere teretia) apice constricto 6-fida vix ciliolata.

B. Brasiliensis, huic affinis, differt foliis subminoribus *persistentibus; basi sat angustioribus* nec decurrentibus, apice *magis profunde fissis;* foliolis minoribus *patulis validioribus* apice magis distincte crenatis; *bracteis plurifidis*, laciniis ciliolatis.

8. Bazzania viridissima, Spruce.

Hab. In monte *Campana*, ad saxa.

F 2·3 × 1·0 (apice × 0·5); *c* $\frac{1}{25}$–$\frac{1}{55}$; *f*^{la} ·8 × ·85^{mm}.

Robusta, viridissima, prostrata stratificata; caules 2-3-pollicares pluries (divaricato-) dichotomi flagelliferi.

Folia imbricata (basi ad $\frac{1}{2}$ lat.) parum decurva, falcata, subdivergentia, longe et oblique ovato-ligulata, apice oblique truncato argute 3-(4-) dentata, dentibus triangularibus peracutis subapiculatisve, medio sæpe submajore, basi anticâ *profunde semicordata caulem transeuntia*, posticâ perpaulo rotundato-dilatata integerrima (haud crispula), cætero margine repandula. Cellulæ mediæ lateralibus plus duplo majores vix vittam formantes.

Foliola triplo fere minora, rotundo-quadrata, apice truncato irregulariter 3–4-crenata-denticulatave, margine subintegerrima, basi obscure cordata, v. semicordata, hinc in auriculam parvam rotundam producta, illinc solum breviter decurrentia.

Fl. dioici: amenta ♂ sola habui.

B. Brasiliensis, affinis, habet *folia dimidio minora, basi angustiora* (*nec semicordata*), *flavida*, *pellucida*, cellulis lateralibus majoribus; *foliola* multo minora, *longiora quam lata*, basi minime subcordata; habitus quoque valde diversus est.

9. Bazzania teretiuscula (Lindenb. et G.).

Mastigobryum teretiusculum L. et G. Spec. Hep. no. 49, t. 20.

Hab. In M. *Tunguragua*, ad arborum truncos (R. S.); Mexico (Liebmann).

F 1·5 × ·75; *c* $\frac{1}{50}$–$\frac{1}{32}$; *f*^{la} ·65 × ·55^{mm}.

Mediocris, dense stratificata, fulva, apice virescens. Caules 3–4-pollicares tenuiusculi anguste dichotomi (angulo 20°–40°); rami apice sæpe hamati, siccando e foliis devolutis teretiusculi; flagella crebra.

Folia subimbricata decurvo-subsecunda—in sicco devoluta—subfalcata, semicordato-ovato-lanceolata, sublinguæformia, apice oblique truncato breviter 2–3-dentata, dente postico sæpius minore infraäpicali, raro apice lanceolata (i.e. solum unidentata), subcanaliculata, repandula, basi antica caulem obtegentia, medio evittata; cellulæ pachydermes pellucidæ convexulæ, mediæ sensim majores nec in falsinervum dispositæ.

Foliola subcontigua, $\frac{1}{2}$ folio subminora, quadrato-oblonga, apice truncato sub 4-crenata, basi excisa, margine repandula.

Obs. Stirps Mexicana subminor est, foliorum dentibus magis acutis, vix autem specifice diversa.

B. tridens (Nees; L. et G. Spec. Hep. t. 14) Javanica, certe diversa est foliis planioribus angustioribus et foliolis minutis.

10. Bazzania planiuscula (G. et Lindenb.).

Mastigobryum planiusculum G. et L. Spec. Hep. 63 t. 12.

Hab. Andes Peruvianos, in M. *Campana*, cum *B. ancistrode;* in M. *Guayrapurina*, *B. bidente* aliisque Bazzaniis implexa. E Mexico attulit LIEBMANN.

F 1·8 × ·8 (*apice* × ·4); *c* $\frac{1}{25}$–$\frac{1}{28}$–$\frac{1}{40}$; *f*^{la} ·7 × ·65, ·6 × ·6; *br* 1·3 × ·6^{mm}.

Mediocris fuscidula prostrata. Caules 2–3-pollicares, parce dichotomi, flagellis crebris validis reptantes.

Folia (basi ad $\frac{1}{3}$ latitudinis) subimbricata, plus minus decurva vel fere plana, angulo subrecto divergentia, subfalcata, a basi ampliore antice semicordatâ postice paulo rotundatâ fere ligulata, vel ovato-ligulata, apice subobliquo argute trifida; dentibus anguste triangularibus acutis subacuminatisve, æquimagnis vel medio majore, haud raro hinc denticulo armatis; cellulæ subopacæ, mediæ sensim submajores, lateralibus tamen concolores nec in vittam ordinatæ.

Foliola vix triplo minora subquadrata, apice 4-vel sæpe 6-fida, dentibus hamatis cuspidatis, raro muticis, margine utrinque 1–2-crenata, crenulis rotundatis acutisve, basi vix brevissime cordata.

Flores dioici. Bracteæ ♀ erecto-patulæ teneræ pellucidæ, intimæ foliis sat breviores ovato-lanceolatæ, trifidæ, laciniis erectis subulato-capillaceis subdenticulatis.

B. Chimborazensis, huic affinis, folia habet submajora, minus ligulata, basi sat latiora, dentibus apicis brevioribus, margine superne subdenticulato; foliola valde irregulariter fissa, ex. p. crenata, ex p. incisula.

11. Bazzania Chimborazensis, Spruce.

Hab. ad arborum ramos in monte *Chimborazo.*

F 2·0 × 1·15 (*apice* × ·4–·5); *c. mediæ* $\frac{1}{25}$, *laterales* $\frac{1}{50}$; *f*^{la} ·9 × ·75, ·8 × ·75; *br* 1·7; *per* 3·5 × 1·15^{mm}.

Elata, ex parte pendula, flavo-viridis laxe stratificata. Caules 3–4-pollicares dichotomi (angulo vix recto) crebre flagelliferi.

Folia subimbricata, falcata, parum decurva, semicordato-ovato-oblonga subtriangulariave, apice truncato serrato-tridentata, dentibus breviusculis triangularibus apiculatis, inferiore sæpe minore, margine apicem versus apiceque erosula subdenticulatave, basi anticâ caulem obtegentia, posticâ paulo dilatata; cellulæ pellucidæ parvæ ad angulos incrassatæ, mediæ pluriseriatæ pallidæ cæteris duplo majores.

Foliola contigua foliis plus duplo breviora quadrato-rotunda oblongave basi breviter subcordata, toto margine varie crenata incisulave insuperque minute erosula.

Flores dioici: fœm. postici. Bracteæ foliis minores teneræ pellucidæ, intimæ ovatæ apice in cilia longiuscula fissæ.

Perianthia foliis haud duplo longiora lanceolato-fusiformia, supra medium obtuse trigona, angulis canaliculatis, ore constricto subciliato.

Mastigobryum uncigerum Nees. Hep. Jav.; L. et G. Spec. Hep. 112, t. 19, differt foliis duplo brevioribus, dimidio supero linearibus, apice minus argute 3(–2)-dentatis, cæterum integerrimis, cellulis omnibus subæqualibus.

11. BAZZANIA FLAVICANS, Spruce.

Hab. In M. *Tunguragua*, ad arbores.

F 2·1 × 1·1 (× ·55 *apice*); $c\frac{1}{55}$–$\frac{1}{50}$–$\frac{1}{20}$; *f*^{la} 1·0 × ·9, 1·05 × 1·05^{mm}.

Mediocris stratificata flavicans *tenera*; caules 2–3-pollicares parce dichotomi, decurvi, flagelliferi.

Folia subimbricata plus minus decurva vel fere plana, siccando immutata, falcata, oblique ovato-ligulata, apice oblique truncato trifidula, dentibus acutis triangularibus supero sæpe longiore, basi anticâ caulem paulo *transeuntia*, posticâ inflexo-crispula vix subdilatata; cellulæ pellucidæ, mediæ sensim multo majores haud in vittam dispositæ, incrassatæ, trigonis maximis.

Foliola duplo breviora, subimbricata, utrinque a foliis libera, rotundo-quadrata, apice truncato obsolete 3–4-crenata, margine integerrima vel obscure subcrenata, basi breviter cordata, auriculis rotundis haud conniventibus.

A *B. stolonifera* Sw. certe diversa foliis haud decurrentibus et foliolis basi cordatis.

13. BAZZANIA VINCENTINA (Lehm. et L.)

Jungermania Vincentina L. et L. Pug. Pl. IV; *Mastigobryum Vinc.* G. L. et N. Syn. Hep. 226; Sp. Hep. 71, t. 13.

Hab. Andes Quitenses, ad arborum truncos et e ramis pendula in sylva *Canelos* juxta fl. *Pastasa* (alt. 1500^{m}) etiam in M. *Tunguragua*, alt. 2500^{m}: R. S.; ad fl. *Napo* (JAMESON). Ex insula Sti Vincentii et Bolivia habuerunt cl. auctores Synopseos.

F 2·5 × 1·5 (*apice* × ·8); *c. mediæ* $\frac{1}{20}$, *laterales* $\frac{1}{55}$–$\frac{1}{50}$; *f*^{la} 1·25 × 1·25; *br* 1·6 × 1·1; *per* 2·9 × 1·2^{mm}.

Elata, valida, fulva vel olivaceo-viridis, prostrata stratificata. Caules 3–9-pollicares badii nigrescentesve, ter quaterve dichotomi (angulo 60°–90°), crebre flagelliferi.

Folia magna subplana, rarius decurva, subdivergentia, basi ad $\frac{1}{3}$–$\frac{1}{2}$ lat. imbricata, apice dissita, subfalcata vel fere recta, semicordato-ovato-ligulata—caulina sæpe latiora et subtriangularia, margine antico inferne rotundato caulem transeuntia, postico subrecto ipsa basi crispula, apice rotundato-truncato tridentata, dentibus brevibus subapiculato-acutis, medio dente multo majore triangulari, sinubus lunatis vel subacutis; cellulæ laterales parvæ pellucidæ guttulatæ, ad angulos incrassatæ, subæquilateræ, medianæ (subocto-seriatæ) 2–3-plo longiores nervum latum fingentes.

Foliola foliis duplo breviora, caule triplo latiora, imbricata subplana suborbiculata—alia quadrato-rotunda—basi cordata, auriculis oblongis subrectis vel conniventibus, toto margine late (sub 8-) crenata, vel solum repanda.

Flores dioici. Bracteæ ♀ primum patulæ demum perianthio adpressæ, scariosæ elongato-reticulatæ, intimæ foliis dimidio—interdum duplo—breviores, ovatæ acuminatæ apice plus minus lacinulato-ciliatæ subinde bilobæ.

Perianthia involucrum subduplo superantia, fusiformia, obtuse 3-plicata, demum ore 6-fida, laciniis apice vel piliformibus vel in cilia pauca brevia erecta fissis; basin versus 2–3-strata, supra medium unistrata. Calyptra duplo brevior basi 3-strata, superne 2–1-strata. Capsula oblongo-subcylindrica.

Amenta ♂ postica, foliolo sublongiore suffulta, incurva crassa ovato-oblonga trigona; bracteæ confertissimæ 5–8-jugæ orbiculatæ valde concavæ emarginatæ retusæve, diandræ; bracteolæ subconformes, integræ vel apice rotundato erosulæ.

Var. *macrophylla* S. Folia elongata (3·0 × 1·8mm). Bracteæ pro ratione breviores, ovato-orbiculatæ. Perianthia maxima (4·0 × 1·0mm).—Ad fluvium *Napo* legit JAMESON.

Var. *submutica* S. Folia apice triangulari-truncata, vel bis retusula, vel denique obsolete 3–4-angulato-dentata. Foliola magna (1·65 × 1·65mm), auriculis baseos falcatis sæpe imbricatis. Perianthia maxima (4·0 × 1·5mm).—In sylva *Canelos* (R. S.)

Obs. Folia basi postica crispata plerumque integerrima, rarius dente brevi uno alterove armata.—Foliola *B. Vincentinæ* in exemplaribus meipso lectæ, et quoque in Antillanis a cl. HUSNOT basi distincte cordata; in 'Spec. Hepat.' descriptione "e basi cordata amplexicauli" dicta sunt, quod tamen figuræ tabulæ citatæ minime monstrant.

14. BAZZANIA ROBUSTA, Spruce.

Hab. Ad fluvios *Negro*, *Uaupés* et *Casiquiari*, in sylvis præcipue humilioribus, super truncos vetustos rupesque necnon ad arbusculorum ramulos.

F 2·5 × 1·25 (*apice* × ·35–·4); *c. mediæ* $\frac{1}{2·5}$, *laterales* $\frac{1}{3·6}$; f^{la} ·9 × ·7, ·9 × ·85; *br* 2·0; *per* 3·8 × 0·9mm.

Robusta rigida rufescens dense stratificata. Caules 4-pollicares, iteratim dichotomi, crebre flagelliferi; rami siccando uncinati.

Folia arctissime imbricata, alterna vel (rarius) subopposita, decurvo-secunda, falcata, valde oblique cordato-lingulata, apice angustiusculo truncato argute tridentata, dente medio paulo majore—raro 4-dentata, dente quarto infra-apicali—sinubus rotundatis, dentibus acutissimis interdum denticulatis, basi anticâ gibba caulem exacte obtegentia, postica subampliata parum recurvo-crispula et erosodenticulata; cellulæ pellucidæ intus 6-sinuatæ, pariete flavido ad angulos valde incrassato, mediæ majusculæ lateralibus sensim minoribus fere concolores. Folium dichotomiale integrum, e cordato-ovata basi sensim acuminatum. Folia flagellorum minuta ovata, apice 2–3-dentata, basi externa raro radicellifera.

Foliola triplo fere breviora, imbricata, oblongo-ovatove-orbiculata, toto margine crenulato-repanda-erosulave, raro apice magis distincte tricrenata, basi cordata, auriculis subrotundis conniventibus margine sinuato-crispulis integerrimis.

Flores dioici. Bracteæ ♀ subappressæ, intimæ foliis subbreviores ovato-lanceolatæ acuminatæ, apice in cilia erecta dissolutæ, concavæ tenerrimæ.

Perianthia foliis dimidio longiora, tenuia, plus 4-plo longiora quam lata, ovato-subulata, a basi fere trigono-plicata, ore constricto ciliis longis sub 15 in penicillum congestis ornata. Calyptra duplo brevior cylindrico-oblonga, basi quasi-stipitata ibidemque pistillidiis sterilibus circumdata. Capsula calyptrâ duplo brevior, oblonga, subcylindrica. Elateres tenues subobtusi dispiri, sporis minutis subduplo angustiores.

15. BAZZANIA HETEROCLADA, Spruce.

Hab. in monte *Guayrapurina*, Andium Peruviæ, ubi in declivibus umbrosis ad rupes arborumque pedem plagas latas densissimas efformat.

F 2·0×1·2 (*basi*) ×·65 (*sinu*) ×35 (*apice*); *c* $\frac{1}{50}$–$\frac{1}{30}$; *f*^{la} ·9×·7; *br. int* 2·0×·9^{mm}.

Albido-viridis dein rufula, stratificata, procumbens vel suberecta. Caules 3–4-pollicares tenuiusculi anguste dichotomi (angulo sub 30°); necnon ramos posticos (e foliorum axilla ortos) foliosos floriferosque —flagella propria autem paucissima, brevia arcuata microphylla subradicellosa—proferentes.

Folia conferta late imbricata, apice dissita, decurvo-secunda, valde falcata, e basi lata ovali sinuato-angustata, triangulari-ligulata, apice truncato grosse tridentata, dentibus brevi-subulatis acutis, basi antica subsemicordata caulem obtegentia; margine postico incurvo, basi valde ampliata tamen recurvulo, sinuque grosse 2–4-spinoso vel solum denticulato; cellulæ parvæ pellucidæ valde incrassatæ, medianæ haud duplo majores in laterales sensim decrescentes (neque nervum fingentes). Folium axillare cæteris longius, ovato-subulatum integrum.

Foliola foliis duplo minora imbricata, quadrato-oblonga, apice breviter 4-fida, dentibus rotundatis acutisve, margine undulato utrinque medium versus in dentem angulumve prominulo; basi subcordata, auriculis mediocribus decurrentibus integerrimis.

Flores dioici: ♀ crebri, subinde in folioli axilla binati. Bracteæ arcte imbricatæ 4-jugæ tenuissimæ, intimæ foliis æquilongæ, ovato-lanceolatæ acutatæ anguste bifidæ (media, *i. e.* bracteola, trifida) erosociliolatæ; bracteæ exteriores sensim minores, apice recurvulæ.

Perianthia (valde juvenilia) 6-plicata, ore 12-laciniata, laciniis subciliatis.

B. spinigera S. differt dentibus foliorum apicalibus divaricatis; foliolis basi spinoso-auriculatis. *B. Gottscheana* Lindenb. (quoad stolones foliosos nostræ similis) folia habet inferne angustiora et inermia; foliola apice subintegerrima.

16. BAZZANIA HUMIFUSA, Spruce.

Hab. M. *Campana* Peruviæ, in declivibus humidis ad terram sub fruticulorum umbra, socio *Sphagno Peruviano*, sterilis.

F 1·7×·85 (*apice*) ×·3); *c* $\frac{1}{20}$–$\frac{1}{45}$; *f*^{la} ·7×·7, ·85×·75^{mm}.

Rufula reptans stratificata. Caules 3-pollicares tenuiusculi parce dichotomi, angulo subacuto, flagellis perraris.

Folia subimbricata subdeflexa, vix falcata, parum obliqua, longe semicordato-triangularia, apice angusto oblique truncato argute 3-dentata, dentibus lato-subulatis subapiculatis (supero paulo minore), basi antica caulem obtegentia, postica rotundata angulatave, raro in dentem obtusum porrecta; cellulæ pellucidæ incrassatæ, trigonis maximis, laterales parvæ, medianæ plus duplo longiores pluri- (sub 12-) seriatæ.

Foliola foliis duplo minora subcontigua subquadrata, apice 4 crenata, basi cordata, auriculis rotundo-oblongis falcatis conniventibus, raro hinc prope basin unidentata.

Var. *olivacea*. Folia interdum bidentata, normalibus tridentatis interposita, basi postica juxta caulem in auriculam parvam rotundatam vel unispinam protracta; foliolis sæpe solum 3-dentatis.—*F* 1·25 × ·6 (*apice* × ·125–·25); *c* $\frac{1}{24}$–$\frac{1}{50}$; *f*^{la} ·55 × ·5^{mm}.—In eodem loco, cum *Aneuris* mixta.

Mastigobryum Hookeri Ldng. (Spec. Hep. 77, t. 14) valde simile videretur; folia tamen habet majora, minus longe dentata, et foliola apice grosse 4–6-incisa.

In var. *olivacea* folia ramorum superiorum omnia fere bidentata sæpe videntur; ab omnibus formis autem *B. bidentis* facile distincta est foliis dimidio longioribus foliolisque basi distincte cordatis.

17. BAZZANIA ANCISTRODES, Spruce.

Hab. in monte *Campana* Andium Peruviæ, ad rupes.

F 1·9 × 1·2 (*apice* × ·4); *c. inferiores* $\frac{1}{25}$, *later. et super.* $\frac{1}{40}$–$\frac{1}{50}$; *f*^{la} ·9 × ·6, ·9 × ·75^{mm}.

Mediocris rufula dense stratificata. Caules 2–3-pollicares, pluries dichotomi, angulo bifurcationis vario, flagellis paucis.

Folia basi ad dimidium fere imbricata, apice dissita, insigniter falcata, valde oblique ovato-ligulata, apice oblique truncato breviter 3-dentata, dentibus triangularibus acutis, uno alterove sæpe obsoleto, basi anticâ semicordata caulem subtranseuntia, posticâ anguste ampliata longe decurrentia juxta caulem persæpe 2–3-spina, cæterum integerrima repandula vel ad sinum subdenticulata; *cellulæ* pellucidæ valde incrassatæ, mediæ pluriseriatæ lateralibus sensim majores nec in vittam dispositæ.

Foliola foliis duplo breviora imbricata rectangulari-ovatove-oblonga, apice rotundato truncato crenulata repandave, margine subintegerrima, basi profunde cordata, auriculis falcatis conniventi-contiguis-imbricatisve paucispinis, raro externe hastatim unispinis.

Flores dioici:

B. spinigera S. huic certe peraffinis, differt foliis subbrevioribus valde *gibboso-falcatis*, dentibus apicis longioribus *divergentibus*, auricula postica magis spinosa; foliolis apice grosse *bis* bifidis (nec solum obsolete crenulatis).

B. acanthostipa S. (e M. Campana) distincta habitu robustiore, colore flavido, *foliorum dentibus apiculatis; foliolis tam latis quam longis*, apice alte 4-crenatis, toto margine auriculisque spinosis.

Mastigobryum arcuatum G. et L. Spec. Hep. 61, t. 12, quoad habitum, folia conferta uncinata, etc. nostræ simile, differt foliis haud decurrentibus at basi gibbis; foliolis minus profunde cordatis basi integerrimis.—*M. stoloniferum* (Sw.), foliis decurrentibus ac in nostra, distincta est tam foliis quam foliolis integerrimis, his basi vix cordatis.

18. BAZZANIA SPINIGERA, Spruce.

Hab. in sylva Amazonica prope fl. *Negro* ostia, in rivuli *Tarumá* ripis; etiam ad *Panuré* fl. *Uaupés*, ad arborum radices in sylvis humilioribus.

F 1·6 × 1·1 *basi* (× ·4 *apice*); *f*^{la} ·9 × ·65; *c* $\frac{1}{40}$^{mm}.

Subhumilis, pallide flavo-viridis, fragilis, stratificata. Caules $1\frac{1}{2}$–2-pollicares, parce dichotomi (angulo vix recto) flagelliferi.

Folia arcte (ultra ½ lat.) imbricata, parum decurvula, ovato-cordatove-ligulata, insigniter gibboso-falcata, valde inæquilatera, apice 3- (raro 4-) dentata, dentibus subinæqualibus subdivergentibus peracutis, sinubus plus minus obtusis, basi anticâ caulem vix exacte obtegentia, posticâ valde rotundato-ampliata ibidemque paucispina, juxta caulem sæpe 2–3-ciliata, angulo externo haud raro bastatim unispina; cætero margine undulato-repanda, postico (basi excepta) late incurva; cellulæ parvulæ pellucidæ, pariete valde incrassato, trigonis sæpe dimidiam cellulam excedentibus, guttulatæ, convexulæ, inferiores mediæ sensim majores subelongatæ haud tamen in vittam dispositæ.

Foliola ½ folium excedentia, ovato-oblonga, apice rotundato-truncato varia, sæpius bis bidentata, dentibus obtusis, acutis, apiculatis acuminatisve, basi profunde cordata spinisque paucis armata, interdum subhastata, juxta caulem sæpe utrinque in spinam longam, cum spina contraria cruciatam, protracta, cætero margine repanda vel subcrenata.

Flores dioici. Bracteæ ♀ erecto-patulæ, foliis breviores, apice bifidæ et ciliato-fimbriatæ.

B. robusta S., ad eundem fluvium Uaupés lecta, differt foliis validis multo longioribus—vix autem latioribus—minus abrupte falcatis, basi postica minus lata solum eroso-denticulatis; foliolis (pro foliis) brevioribus, toto margine crenato-repandulis, auriculis baseos suborbiculatis integerrimis.

Duæ species, in Andibus Peruvianis lectæ, a *B. spinigera* differunt: *B. acanthostipa* S. foliis magis elongatis, foliolis (pro ratione) minoribus quadratis; 2. *B. heteroclada* S. foliis majoribus, foliolis quadrato-oblongis basi inermibus.

19. BAZZANIA ACANTHOSTIPA, Spruce.

Hab. Andes Peruvianos in M. *Campana*, ad saxa, aliis Bazzaniis consociata.

F 2·0 × 1·15, 2·2 × 1·2; *c. mediæ inferiores* $\frac{1}{20}$, *laterales* $\frac{1}{44}$; f^{la} ·85 × ·85^{mm}.

Elata, erecta procumbensve, stratificata, pallide flavida. Caules 6–8-pollicares simplices vel semel bisve dichotomi, flagelliferi.

Folia tenera distiche patula, parum decurvula, basi ad ⅓ lat. imbricata, subfalcata, valde oblique semicordato-ovato-lingulata, apice oblique truncato subacute tridentata, dentibus triangularibus apiculatis, basi antica caulem transeuntia, postico ampliata ibidemque recurvula 4-spina, spinâ infimâ longiore supra caulem protractâ; cellulæ pellucidæ, trigonis maximis, mediæ inferiores elongatæ lateralibus sensim duplo longiores nervum indistincte fingentes.

Foliola 2½plo breviora subcontigua cordato-quadrata, apice rotundato truncatove acute 4-crenata, crenulis oblongis rotundatis vel abrupte apiculatis, margine utrinque grosse 1–2-dentata, raro inermia, basi cordato-biauriculata, auriculis conniventibus imbricatis oblongis recurvo-crispis vario modo 2–4-spinis.

B. spinigera diversa est foliis brevioribus insigniter arcuato-falcatis; foliolis pro ratione multo majoribus, margine laterali integerrimis; *B. heteroclada* statura humiliore, ramis posticis sæpe foliosis ramulosisque, neque solum flagelliformibus; foliis confertis apice longidentatis; foliolis basi integerrimis decurrentibus, vix cordatis.

XIV. MICROPTERYGIUM, Lindenb. N. et G. Syn. Hep.

Genus, habitu distinctissimum, ab affinibus *Bazzania* et *Lepidozia* fructificatione sola ægre dignoscendum, congruit enim florescentiis hypogenis cæterisque caracteribus, nec differt nisi bracteis ♀ carinatis, perianthiis ore longissime ciliatis, capsula prælonga cylindracea bistrata, et floribus ♂ constanter monandris. Quoad ramificationem autem foliaque differentias maximi momenti ostendit. *Plantæ* subpusillæ in cespites magnos depressos crescunt. *Caules* plumæformi-imbricati, a caudice repente subaphyllo radicelloso orti, arcuantes, laxe pinnati; rami laterales, foliis exacte axillares, cum foliis devexi; adveniunt etiam rami postici, persæpe ad flagella radicantia redacti, interdum ad caulis instar pinnati et foliosi. *Folia* incuba, equitanti-imbricata vel subdissita, celluloso-denticulata vel apice serrulata, profunde complicato-biloba, lobis fere vel usque ad apicem connatis, superiore majore, suturâ cum inferiore longe intramarginali (unde folia ad carinam late alata evadunt). *Rete* pro m. densissimum, e cellulis conico-prominulis verruculosis exasperatum; solum in *M. leiophyllo* laxius, cellulis subplanis lævibus. *Foliola* ubique præsentia, foliis 2–10plo minora, angusta vel subrotunda, apice 3–4-dentata-spinulosave.

Hab. In sylvis calidis opacis ad truncos prostratos cariosos, rarius ad saxa vel ad arbores vetustas.

Distr. Genus pulcherrimum solum in America tropica, æquatoriali præcipue, in die cognitum. In sylvis fluminis Amazonum et in Andium orientalium radicibus valde abundat. Species autem perpaucas cognovimus, in libris confusas et inextricabiles. *Micropterygium vulgare* Nees in Syn. Hep. et in Spec. Hepat. Lg. et G. species plane composita est. Specimina sub nom. "*Micropt. vulgare*" a beato Montagne mecum communicata, pro typo *Jung. Pterygophylli* Martii (an recte?) habui. *Jung. cymbifolia* Lehm. et Lg., e Guadalupa allata, (ad Novum Eboracum per errorem indicata) mihi adhuc ignota restat.

Obs. Mastigobrya 3, a cl. Lindenberg et Gottsche in opere suo præstantissimo 'Species Hepaticarum' descripta, sc. *M. anisostomum* L. et L. (e Nova Zelandia); *M. inæquilaterum* L. et L. et *M. echinatum* G. (ex India orientali), ad *Micropterygium* e longinquo accedunt: foliis canaliculatis, apice inæqualiter bilobis, facie asperis, necnon foliolis apice trifidis; distinctæ autem foliis minime complicatis, perianthiis ipso ore solum denticulatis, &c., &c. Easdem pro genere proprio, a *Mastigobryo* (i.e. *Bazzania*) bene distincto, rite habendas censeo.

1. *M. parvistipulum.* Parum ramosa, ramis oligophyllis. F. equitantia, ad basin fere usque complicata ; lamina superior triplo longior quam lata, ovato-lanceolata oblique acuta subserrulata, facie aspera ; l. inferior duplo angustior, lanceolata ; ala laminæ inferiori similis æquilonga, minus lata ; cellulæ præminutæ, in conum truncatum asperulum prominulæ. Fla foliis 10plo breviora, cuneato-rotunda, apice 3–4-dentata integerrimave. Perianthia trigona albida, ore longiciliata.
2. *M. Pterigophyllum.* Vage ramosa, ramis polyphyllis. F. vix imbricata, ad basin fere usque complicata, serrulata, aspera ; l. sup. duplo longior quam lata, sublingulata acutata ; l. inf. vix duplo angustior, acuminata ; ala angustiuscula, longe supra folii basin desinens ; c. minutulæ prominulæ et asperulæ. Fla foliis plus duplo breviora, suborbiculata serrulata, apice argute 3-dentata. Per. superne alte 3-carinata, ore longissime ciliata.
3. *M. angustistipulum.* Laxe pinnata, pinnis longiusculis. F. equitantia repanda asperula ; l. sup. subduplo longior quam lata, ovato-oblonga, truncato-obtusata ; l. inf. superiore plus duplo angustior, paulo brevior ; ala laminæ inferiori subæquilata ; c. præminutæ prominulæ asperulæ. Fla foliis vix duplo breviora, angusta, ovato-lanceolata, apice spinoso-2–4-dentata, raro integra.
4. *M. leiophyllum.* Laxe pinnata, pinnis pro m. brevibus. F. subequitantia sublævissima, apice truncato pauciserrata, ovato-oblonga, solum in dimidio supero complicata ; l. inferior alaque l. superiore plus triplo angustiores ; c. parvæ planiusculæ pellucidæ. Fla foliis duplo breviora, ligulato-oblonga, apice 3–4-spinulosa. Per. omnium maxima, linearia, obtuse trigona, ore longiuscule ciliata.

1. MICROPTERYGIUM PARVISTIPULUM, Spruce.

Hab. in truncis prostratis cariosis ubique sylvarum ad fluv. *Negro* et *Uaupés* ripas, in nemore arenoso *Umirisál* dicto prope *Manaos* præcipue, frequens.

F. lam. sup ·75 × ·25, inf ·7 × ·15, ala 1mm lata, c $\frac{1}{50}$; fla ·07 × ·08; bracteæ 1·35 × ·4–·5 ; per 3·0 × 0·5, caps 1·0 × ·35mm.

Pallide viridis, late cæspitoso-procumbens. Caules 2cm longi, basi subaphylli radicellosi, dein arcuantes, folia distantia parva ovata acuminata alato-carinata gerentes. Rami laterales pauci, 3mm longi, suberecti, plumæformi-arcuati, ambitu (cum foliis sub 15-jugis) lineari-lanceolati ; postici perpauci flagellares.

Folia equitanti-imbricata planiuscula, leniter decurvula, angulo axillari sub 70° patentia ; lamella superior oblique ovato-lanceolata, triplo longior quam lata, oblique acuta, basi semicordata, margine distanter serrulata necnon cellulis prominulis valde crenulata erosulaque, faciebus asperrima ; l. inferior basi vix brevior, apice cum superiore contermina, lanceolata acutata, basi rotundata ; ala lamellæ inf. æquilonga, angustior tamen ; cellulæ præminutæ pachydermes angulato-rotundæ-oblongæve, in conum truncatum asperulum alte prominulæ, carinam versus majores rectangulares.

Foliola præminuta, foliis 10plo breviora, cauli vix æquilata, cuneato-rotunda, apice irregulariter 3–4-dentata raro subintegerrima, pro m. arhiza.

Flores dioici : ramulus ♀ e caulis facie inferiore ortus, brevissimus, basi radicellis villosus. Bracteæ 6, biseriatæ, appressæ, 3 exteriores minutæ, interiores foliis duplo fere longiores, anguste ovato-oblongæ,

carinatæ, apice angusto bifidulæ longiciliatæque, cætero margine distanter ciliolatæ, reti laxo elongato lævi nonnisi apicem versus asperulo.

Perianthia magna, ramis foliosis subæquilonga, albida lineari-subulata trigona, ore in cilia prælonga flexuosa plurifida, reti superne asperulo, inferne lævi et valde elongato. Calyptra duplo brevior tenuissima, demum irregulariter rupta. Capsula magna cylindrico-oblonga.

Amenta ♂ breviuscula incurva albida; bracteæ 5–8-jugæ confertæ pellucidæ ovato-cymbiformes, acumine breviusculo tenui sæpe bidentulo, margine hic illic denticulato. Antheridia solitaria.

2. MICROPTERYGIUM PTERYGOPHULLUM (Mart.)

Jungermania Pterygophyllum Nees in Mart. Fl. Bras. icon. t. 19; *Micropterygium vulgare* Nees, Lg. et G. Syn. Hep. p.p.

Hab. ad truncos putrescentes in monte *Guayrapurina* Andium Peruviæ. Guiana gallica (Montagne, hb.)

F. lamina sup. ·6 × ·3, *inf* ·5 × ·18, *ala* ·4 × ·08; *f^la* ·25 × ·25; *c* $\frac{1}{60}$–$\frac{1}{55}$; *br. intima* 1·6 × ·55; *per* 3·5 × ·55, *cilia* ·4–·7 *longa; cal* 1·35 × ·55; *caps* 1·0 × ·35^mm.

Pallide viridis cæspitoso-procumbens, plagas magnas laxas formans. Caudex breviter repens subdivisus, radicellosus subaphyllus, caules pollicares assurgenti-arcuantes et flagella radicantia edens. Caules vage inæqualiter ramosi; rami laterales pro more polyphylli, raro ramulosi; postici vel tota longitudine, vel basi sola radicelliferi, superne foliosi interdum ramulosi. Radicellæ fasciculatæ, sub 6 (4–12) in quoque fasciculo, e foliis minutis (squamæformibus) tristichis ortæ.

Folia subdissita vel parum imbricata, late patentia, supra subtusque convexula, e cellulis prominulis scaberulis exasperata; lamella superior trapezoideo-lanceolata-lingulatave sensim acutata, margine supero rectiusculo solum basin versus late rotundato vel etiam subsemicordato; l. inferior apice cum superiore contermina, basi subbrevior, medio vix duplo angustior, lanceolata acuminata serrulata; ala folio 4-plo fere angustior, longe supra basin desinens; cellulæ minutulæ subpellucidæ, rotundo-quadratæ-hexagonæve, facie alte convexæ conicæve, minute tuberculosæ.

Foliola subcontigua, foliis plus duplo breviora, suborbiculata concava, apice incisulo-3-dentata, toto margine subserrulata.

Flores dioici: ♀ ramulo brevissimo postico, basi polyrhizo, e caudice vel sæpe e caule folioso orto, constantes. Bracteæ 6, biseriatæ appressæ; intima (postica) foliis caulinis triplo fere longior, oblonga acuminata, triplo longior quam lata, tenuissima, carinata, apice in cilia 3–4 prælonga dissoluta, cætero margine subciliata, reti elongato pellucidissimo; bractea secunda sublatior firmiorque, minus ciliata; br. tertia paulo minor; bracteæ seriei exterioris multo minores, extima minuta.

Perianthia magna, involucrum plus duplo superantia, lineari-trigona subulato-acuminata superne alte plicato-tricarinata, apice connivente in cilia longissima ($\frac{1}{2}$^mm) soluta, cellulis angustis, triplo longioribus quam latis, fere vacuis, planis sed minutissime asperulis, conflata. Pistillidia ad 15 vidi: sterilia demum calyptræ basi adnata. Calyptra perianthio triplo fere brevior, pyriformis pallida tenuis, cellulis unistratis inæquilateris 4–7-gonis constans, demum apice fisso bilabiata.

Pedicellus validus brevis. Capsula magna cylindraceo-oblonga, triplo fere longior quam lata.

Amenta ♂ in planta propria, ramum posticum breviorem longioremve terminantia, circinnata, julacea ; braceteæ ad 12-jugæ, imbricatæ, subrotundæ, cymbiformi-complicatæ (arte explicatæ paulo latiores quam longæ), acuminulatæ bidentulæve, subdenticulatæ, valde pellucidæ. Bracteolæ oblongo-rotundæ bifidulæ ubique obviæ.

Specimina sub nom. "Micropterygium vulgare Nees," a cel. Montagne recepta, ad hancce speciem spectant. Folia e cellulis alte et subacute conicis asperrima, toto margine serrulata et celluloso-erosa. Foliola quadrato-rotunda, apice subtridentata, valde celluloso-serrulata, ramorum tenuiorum oblonga ovaliave, bifidula. Perianthia omnino eadem ac in nostra.

In M. *Campana* aderat forma dense late cæspitosa, ex albido-viridi rufula ; foliis confertis laxe complicatis cymbiformi-concavis abrupte acutis, lamella inferiore latiore, ovato-lanceolata, ala breviore, cellulis supra subtusque in conum truncatum verruculosum alte prominulis. (*M. Campanense* Mst.)

3. MICROPTERYGIUM ANGUSTISTIPULUM, Spruce.

Hab. ad saxa in M. *Campana* cæterisque Andibus Peruvianis inferioribus, alt. circiter 1000^{m}.

F. lobus ·6 × ·33, *lobulus* ·5 × ·15, *ala* ·5 × ·125, *c* $\frac{1}{80}$; *foliola* ·35 × ·15^{mm}.

Cæspitosa pallide rufula. Caules vix pollicares, basi brevi repentes, dein assurgentes et arcuato-decurvi, vage vel laxepinnatim ramosi, ramique (sæpius elongati) subæquifoliati, solum basi apiceque subparvifolii ; hic illic, basin versus præcipue, rarius e medio tergo apiceve, flagella pallida tenuia flexuosa centimetrum longa, primo visu aphylla sed radicellosa, proferentes. Alia flagella autem apice normaliter foliosa interdumque ramulosa.

Folia pulchre disticha, æquitanti-subimbricata, arcte complicata ; lobus (s. lamina superior) duplo fere longior quam latus, oblique ovato-oblongus vel subrhomboideus, truncato-obtusatus, basi dilatatus subinde subsemicordatus, margine e cellularum tuberculis minutissime asperulo, superne angulato-repando rarius grosse subdenticulato ; lobulus (s. lamina inferior) dimidio lobo subangustior, eidem margine suo inferiore adnatus, haud tamen ad lobi ipsum marginem sed paulo intra (sicuti limbus alave lobulum superstet), paulo ante folii apicem sensim vel subabrupte desinens, margine superiore scaberulo repando ; ala semilunari-lineari-lanceolata, lobulo subæquilata. Cellulæ præminutæ, subguttulatæ, subquadratæ rhombeæve (medium folii versus distincte subhexagonæ) parum prominulæ, tota superficie crebre minute tuberculosæ, unde folia asperula evadunt.—Folia flagellorum foliolaque minuta, subæquimagna, distantia, squamæformia, apice vel integra vel digitatim fissa ; radicellæ (sæpius 8), omnibus foliis adjectæ, 4–10-fasciculatæ, filiformes, pallidæ.

Foliola dimidio folio sublongiora, concava, subappressa, vix imbricatula, ovato-ovalive-lanceolata, apice spinoso-bidentula vel 3–4-dentata, raro integra et acuminata.

Flores dioici : ♀ subbasales, ramulo brevi sistentes (imperfecti solum visi).

M. Pterygophyllum, huic proxima, differt foliis foliolisque toto margine

serrulatis, foliorum ala duplo angustiore basi longe breviore, foliolis paulo brevioribus suborbiculatis (nec lanceolatis).

4. MICROPTERYGIUM LEIOPHYLLUM, Spruce.

Hab. per planitiem Amazonicam valde frequens, in sylvis primævis umbrosis ad saxa et arborum truncos tam vivos quam prostratos et putrescentes; locis (Brasiliæ) *Caripi*, *Manáos*, *Tarumá*, *S. Gabriel*, fl. *Uaupés*, &c.; (Venezuelæ) *Cocúi*, *S. Carlos*, &c. In Andibus orientalibus rarior est et vix supra 900^{m} ascendit.

F ·85 × ·43, *lamina inf.* ·4 × ·25; *f^{la}* ·4 × ·18; *c* $\frac{1}{50}$; *br. int* 1·5 × ·55; *per* 4·5 × ·75; *caps* ·75 × ·3^{mm}.

Pallide viridis pellucida, in plagas latas laxiusculas extensa. Caules 3–4 ^{m} longi, validi, 8 cell. diametro, 20 cell. circiter circumferentia, arcuato-reptantes, intricati, basi subaphylli et flagelliferi, dein distanter parvifolii laxepinnatim ramosi. Rami distantes, laterales simplices erecti, apice decurvi (in sicco circinati) oligo-(raro poly-) phylli; postici pauciores, plerumque flagellares rufescentes flexuosi parce radicellosi, alii autem foliosi iterum ramulosi.

Folia subimbricata decurvulo-secunda sublævissima, oblique ovato-oblonga, apice subrecte-rotundatove-truncato pauciserrato-dentata (dentibus 4–7), cætero margine repandula integerrima, dimidio inferiore subplana vel caviuscula, superiore laxe et valde inæqualiter complicata; lamina postica folio duplo brevior, plus triplo angustior, semilanceolata, apicem versus 2–3-denticulata; ala laminæ subconformis, integerrima; cellulæ parvæ (pro genere majusculæ) pellucidæ, subpachydermes, planiusculæ, subrhombeæ, carinam versus longiores et rectangulares vel subhexagonæ, endochromio parco.

Foliola foliis duplo breviora, contigua, erecta, subconcava, ligulato-oblonga, apice 3–4-spinulosa, raro radicellifera.

Flores dioici: ♀ rari, in ramo brevissimo postico terminales. Bracteæ 9, tristichæ, appressæ; exteriores minutissimæ; intima foliis 3plo fere longior, ligulato-oblonga, apice profunde inciso-ciliata, ciliis sub 4 latiusculis flexuosis subciliolatis, cætero margine subciliolata; bracteæ duæ proxime sequentes sensim minores, latiores, minus incisæ: omnes tenues pellucidæ obtuse carinatæ.

Perianthia maxima, bracteis triplo longiora, linearia obtuse trigona incurva lævissima, apice subconstricto in cilia longiuscula torta soluta; cellulæ anguste rectangulares. Calyptra plus duplo brevior, tenuis. Capsula elongato-oblonga bistrata; cellulæ strati exterioris oblongo-quadratæ, pariete trabeculato, interiores fibris semiannularibus intus fulcitæ. Elateres longi, laxe dispiri, folliculo tenuissimo. Sporæ minutæ, diametro elateribus subminores, læves.

Andrœcia tenuispica, varie posita, plerumque ramulum posticum totum, vel ejus apicem solum tenentia, rarius in ramis lateralibus terminalia. Bracteæ ad 10-jugæ, parvæ tenerrimæ confertæ assurgenti-secundæ orbiculatæ concavissimæ eroso-denticulatæ, inferiores muticæ, superiores acuminatæ. Antheridia solitaria globosa, in stipite æquilongo. Bracteolæ longitudine bractearum, lanceolatæ, utroque fine acuminatæ.

Ad *S. Gabriel* fluvii *Negro*, in sylvis humilioribus ad arborum radices, advenit forma luxurians, densa, sæpe bipinnata; ramis foliisque planioribus, his magis serratis, dentibus ad dimidium folium fere descendentibus;

foliolis ovalibus apice argute 3–4-spinis. Ad hanc formam spectare videtur "*Micr. vulgare*" Spec. Hepat. quoad *fig.* 4. *tabulæ* 21, foliolis apice autem 4-ciliatis.

XV. MYTILOPSIS, Spruce.

Nov. gen. in tractatu "De *Cephalozia*" (a. 1882).

Caudex brevis prostratus subdivisus rhizomatosus, *caules* linearifrondiformes arcuantes, subsimplices vel paucirameos edens, ramis omnibus hypogenis, aliis flagellaribus. *Folia* perfecte plano-disticha complicato-carinata subæquivalvia, margine parum hiantia, valvulis lamellisve ad apicem usque accretis, carina superne angustissime alata; cellulæ præminutæ pachydermes verruculosæ. *Foliola* caulina omnino nulla. *Flores* cladogeni: ♂ amentiformes, *bracteæ* monandræ. *Bracteæ* floris ♀ 2–3-jugæ, tristichæ, intimæ foliis sublongiores, tenuissimæ, obtuse complicatæ bifidæ subciliatæ. *Perianthium* liberum elongatum leptoderme, inferne 4-(rarius 3-)angulum, apice 6–8-plicatum, ore longiciliatum. *Calyptra* libera tenuis. *Capsula* oblongo-cylindrica bistrata, cellulis internis vacuis. *Elateres* dispiri. *Sporæ* tuberculosæ.

Hab. et *Distr.* Unicam speciem adhuc cognitam locis cavis Andium orientalium Peruviæ inveni.

A *Micropterygio* distincta erit *Mytilopsis* defectu foliolorum, foliis æqualiter complicatis, structura perianthii, &c. &c.

1. MYTILOPSIS ALBIFRONS, Spruce (TAB. xiv.).

Hab. in montibus Andium Peruvianorum orientalium, alt. circiter 1000 metra supra mare, haud infrequens, locis cavis umbrosis ubi ad folia emortua saxaque cæspites latos efficit. Fructum rarissimum nonnisi ad fluvii *Cumbasa* caput reperi.

Caules $\frac{1}{2}$–$1\frac{1}{2}^{cm}$ longi, (cum foliis) $1{\cdot}2^{mm}$ lati; f. lob. 65 × ·3, c $\frac{1}{80}$; br ·75 × ·5; br^{la} ·9 × ·5; per 2·0 × 0·6, 1·35 × 0·5; cal 1·0–·8; caps ·8 × ·5; elat $·25^{mm}$.

Cæspitosa, albescens, albido-viridis, raro roseo picta, opaca, in sicco fulva, rigidiuscula et fragilis. Caudex prostratus flexuosus divisus rhizomatosus et radicellosus, caules assurgentes erectosve, apice decurvulos, foliosos, solum basi brevi spatio subaphyllos, fertiles (cum foliis 20–27-jugis) frondem lineari-lanceolatam, steriles (cum foliis sub 40-jugis) linearem, sistentes, paucirameos edens. Rami omnes postici, alii breves ad florescentiam redacti; alii flagelliformes, folia minuta et radicellas gerentes, alii normaliter foliosi.

Folia perfecte disticha, transversa, arcte complicata, marginibus parum hiantia, contigua vel subequitantia, arte explanata cordato-oblonga; lamellæ lineari-rhomboideæ, fere æquimagnæ, paulo ante apicem grosse unidentatæ, toto margine eroso-repandæ et minute verruculosæ; anterior dimidio inferiore posteriorem perpaulo superans et in alam perangustam (1–3 cell. latam) repandam ultra carinam protracta;

cellulæ præminutæ subrotundæ, intus 6-sinuatæ, carinam versus oblongo-hexagonæ, omnes convexulæ, minute tuberculosæ, pariete incrassato, trigonis magnis. Folia caulina apice valde fissilia, raro revera subbifida. F. flagellorum minuta cochleata bifida.

Foliola caulina omnino nulla.

Flores dioici postici: ♀ e caudice, rarius e caule orti, interdum fasciculato-2–3-ni. Bracteæ tristichæ, bi-trijugæ, 3 interiores foliis sublongiores, tenuissimæ, ovatæ, obtuse complicato-concavæ, ad $\frac{1}{3}$ bifidæ, segmentis tenui-acuminulatis, superne subciliatæ, reti laxiore elongato rectangulo et rhomboideo-hexagono vacuo; intima (bracteola) paulo longior, ad $\frac{1}{2}$ fissa, inciso-ciliata. Bracteæ exteriores multo minores, late oblique ovatæ concavæ, apice integræ bifidulæve.

Perianthia bracteas plus duplo excedentia, tenuia, anguste pyramidato-fusiformia, inferne obtuse 3-vel sæpius 4-gona, apicem versus 6–8-plicata, ore conniventi-clauso ciliis longis flexuosis fimbriata, textura bractearum. Calyptra paulo brevior ovalis tenuis. Capsula oblongo-cylindrica, vix duplo longior quam lata, pallide badia, bistrata; cellulæ ad parietes laterales trabeculis paucis fulcitæ, strati interioris fibra semiannulari carentes. Elateres longiusculi, laxe dispiri, subacuti. Sporæ globosæ, elaterum diametro, tuberculosæ.

Andrœcia amenta tenuia postica arcuata sistentia; bracteæ paucæ orbiculatæ concavæ, apice bidentes, monandræ.

Obs. The branches spring from the middle of the under face of the stem. The leaves veil the stem with their cordate base both at front and at back, and their bases imbricate those of the opposite side of the stem; so that the branches also are veiled at their insertion by the leaf-bases on both sides, but are not axillary to them as the pinnate branches of *Micropterygium* are. The ♀ branches, usually shortened down to the flower alone, are sometimes elongate and flagelliform, radicellose except at the flowering apex.

XVI. CEPHALOZIA, Dum. emend.

Recueil d'Obs. sur les Jung. (1835). *Trigonanthus* Spruce,

Ann. and Mag. Nat. Hist. (1849). *Jungermaniæ* sp. Syn. Hep.*

Plantæ e prothallio lineari filiformive, interdum ramoso, ortæ, pro more pusillæ minutæve, raro majusculæ, foliosæ—in unica specie frondosæ—radicellosæ, subramosæ, ramis omnibus hypogenis (e facie caulis inferiore ortis), nisi in aliis speciebus subgeneris *Cephaloziellæ* quibus accedunt rami pauci (rarissime omnes) laterales. *Folia* succuba, in paucis subtransversa, sat lata, plus minus concava, vel subcomplicata, in plerisque subæqualiter biloba, in paucis integra, margine incurvulo—nullibi reflexo—integerrimo, rarius denticulato. *Foliola* foliis minora, in plerisque speciebus ex parte vel omnino nulla, ad florescentias autem semper præsentia. *Flores* dioici vel monoici (autoici, raro paroici); ♂ monandri, in amentis posticis,

* Conf. etiam tractatum '*On Cephalozia.* Rich. Spruce, 1882.'

rarius in spicis terminalibus, positi. *Flores* ♀ in plurimis speciebus cladogeni, in perpaucis normaliter acrogeni, in aliis situ vario nunc terminales nunc postici. *Bracteæ* in capitulum congestæ, tristichæ, sæpissime trijugæ, bi- (dein 3-4-) lobæ, inter se (saltem intimæ) sæpe connatæ, a periantho tamen liberæ. *Pistillidia* 20, raro pauciora. *Perianthium* elongatum trigono-prismaticum (in subgenere *Cephaloziella* 3–6-gonum), ore truncato constricto varie fisso denticulatove, raro integerrimo. *Calyptra* parvula, basi pistillidiis sterilibus circumdata. *Capsula* oblonga, ab ipsa basi quadrivalvis, bistrata, cellulis strati interioris fibris semiannularibus fulcitis: pedicello elongato tenui, cellulis in longitudine sub 60-seriatis conflato, suffulta. *Elateres* dispiri decidui. *Sporæ* minutæ.

Hab. Loca umbrosa et subhumida in sylvis et rivulorum ripis planitiei et montium humiliorum, ad terram, saxa, et præprimis ad truncos putrescentes. Loca aperta fugiunt, turbariis et sphagnetis exceptis, ubi inter muscos hygrophilos nidulant. Nullo climate nisi frigidissimo exules, species perpaucæ alpinæ vel arcticæ in die cognitæ.

Dist. In zonis temperatis, boreali præcipue, magis frequenter adveniunt *Eucephaloziæ* et *Cephaloziellæ;* sub æquatore paucæ species, istæque propriæ, inveniuntur. *Proto-Cephalozias*, *Pteropsiellas* et *Alobiellas* solum ex America tropica possidemus. *Zoopsis* habet tres species, alteram Amazonicam, alteras duas Australasicas et Malayanas. *Odontoschismatis* paucæ species bene cognitæ cosmopolitanæ fere videntur, nullis terris nisi australioribus deficientes.

Subgenus I. *PROTO-CEPHALOZIA*, Spruce, op. cit. (1882).

Caulis nullus, nisi axiculus floris feminei brevissimus, ex ipso prothallio ortus. *Bracteæ* foliaceæ tristichæ profunde bilobæ. *Perianthia* trigona, ore in 6 lacinias longas fissa. *Andræcia* in prothallii ramis nematoideis terminalia, spicata, bracteis minutis monandris.

1. CEPHALOZIA EPHEMEROIDES, Spruce. (Tab. XV.)

In sylvis fluvii *Negro* superioris, locis S. Carlos et Catanacunámi, ad terram umbrosam.

Filamenta ·8–1·6^{mm} longa, eorundem cellulæ $\frac{1}{16}$–$\frac{1}{8}$ longæ, $\frac{1}{16}^{mm}$ latæ; br. ♀ 1·75, cellulæ $\frac{1}{12}$–$\frac{1}{8}$; per 2·5; caps ·3 × ·18^{mm}.

Minuta albescens acaulis, facie *Ephemeri æquinoctialis* Spruce. Protonema cæspitosum, filamentis confervoideis suberectis fastigiatis subdichotome ramosis constans. Cellulæ filamentorum uniseriatæ—rarissime basin versus biseriatæ—vix duplo longiores quam latæ, pellucidæ

chlorophyllosæ. E filamentorum fasciculi basi oritur flos ♀ ; alia filamenta apice in amenta ♂ abeunt : florescentia igitur monoica.

Bracteæ floris ♀ trijugæ tristichæ confertæ suberectæ, intimæ majusculæ bifidæ-partitæve integerrimæ, lamina basali ovata, laciniis subulatis apice fere capillaribus ; bracteola bracteis æquilonga, magis profunde fissa ; cellulæ magnæ tenues pellucidæ lineari-hexagonæ-parallelogrammæve. Bracteæ exteriores sensim minores, conformes.

Perianthia bracteas solum dimidio superantia, pellucida, trigono-subulata incurva, ore (tam sterilium quam fertilium) profunde (ad $\frac{1}{3}$–$\frac{1}{2}$) sexfida, laciniis tenuibus flexuosis capillaceo-acuminatis. Capsula parvula oblonga.

Andrœcia bracteis fœmineis plus duplo breviora tenuia recurva ; bracteæ sub 10-jugæ minutæ incurvo-secundæ ovatæ bifidæ monandræ.

Subgenus II. *PTEROPSIELLA*, Spruce.

Pteropsiella Spruce in Journ. Bot. (1876).

Plantæ sat robustæ, pro filicula, *Metzgeria* vel *Pallavicinia* quadam facile prætervisæ. *Caulis* validus, utrinque prælate alatus, revera frondiformis, serpentinus, facie infera ramos alios frondosos, alios flagelliformes, alios floriferos proferens, folia autem nulla parte præter ad florescentias ostendens. *Bracteæ* ♀ folia tristicha profunde bifida sistentes. *Perianthium* prælongum lineari-subulatum trigonum, leptoderme, ore 6-laciniatum. *Calyptra* parva tenuis. *Capsula* oblongo-cylindrica cæteraque omnino *Cephaloziæ*. *Andrœcia* amentiformia, postica, raro in ipso caule terminalia ; bracteæ monandræ.

2. CEPHALOZIA FRONDIFORMIS, Spruce. (Tab. XVI.)

Pteropsiella frondiformis S. in Journ. Bot. 1876.

Hab. in aggeribus umbrosis, rivulorum ripis, truncis semiputridis, fructibus lignosis decisis, etc., ad fluvios *Negro*, *Uaupés* et *Casiquiari*, frequens, prope pagum *San Carlos* præcipue.

Cellulæ frondis $\frac{1}{24}$–$\frac{1}{20}$^{mm}, *bracteærum* $\frac{1}{10}$^{mm} *longæ*. *Bracteæ intimæ* 1·3 × ·8 ; *per* 3·8 × ·7 ; *cal* ·9 × ·6 ; *caps* ·75 × ·3 ; *amenta* ♂ 1·5–2·0 ; *br* ♂ ·3 × ·2^{mm}.

Frondes 1–2-pollicares olivaceo-virides prostratæ planæ serpentinæ, ramos paucos posticos frondiformes simplices—raro iterum ramosos—edentes, basi ad solam costam redactæ, deinde in laminam tenuem lato-linearem—hic illic constrictam adeoque inæquilatam—apice angustatam, dilatatæ ; subtus per intervalla radicellas breves fasciculatas, necnon flagella aphylla radicellis hirta demittentes. Caulis (costave) validus semicylindricus, supra planus 2–3-cellulas latus. Cellulæ caulis corticales 9-seriatæ brevi-cylindricæ subcompressæ pellucidæ, internæ 2–3-plo angustiores sub 20-seriatæ subopacæ. Pagina frondis latitudine inæqualis, plerumque utrinque 4–6-cellulas lata, hic illic ad 12 cell. usque lata, margine crenulato-erosa ; cellulæ majusculæ elongato-4–6-gonæ, in seriebus angulum 70° cum costa formantibus dispositæ, pellucidæ, fere vacuæ, leptodermes, in ætate subincrassatæ, marginales longe minores.

Flores dioici : ♀ ramulo perbrevi, facie costæ postica oriundo, sursum curvato, constantes. Bracteæ 3-stichæ, 3–4-jugæ ; intimæ multo

majores liberæ pallidæ pellucidæ elongato-areolatæ ovatæ, ultra medium bifidæ, laciniis tenuiacuminatis denticulatis spinulosisve; bracteolæ bracteis conformes, dimidio minores vel fere æquimagnæ.

Perianthia bracteas triplo superantia, incurva elongata lineari-subulata triquetro-prismatica, ore constricto 6-fida, laciniis capillaceo-acuminatis subspinulosis. Calyptra perianthio 4-plo brevior ovalis tenuis. Capsula oblongo-cylindracea, ad basin usque 4-valvis, bistrata; cellulæ exteriores tesselatæ, columnis parietalibus hic illic fulcitæ, interiores fibris semiannularibus dissitis notatæ. Elateres breviusculi subobtusi dispiri, nonnulli basales cæteris breviores obtusati. Sporæ globosæ, elateribus æquilatæ, minute tuberculosæ.

Amenta ♂ postica—raro in frondis ipsius apice terminales—olivaceo-viridia, julacea; bracteæ 10–20-jugæ, confertæ assurgenti-secundæ rectangulari-cuneatæ breviter bifidæ, segmentis frequenter in cornua brevia porrectis, concavæ monandræ. Bracteolæ pro more (nec semper) adjectæ sunt: parvæ, quadratæ bidentatæ, dentibus cellula 1–2 constantibus.—Plantæ monoicæ raro adveniunt.

This species is fond of growing on the decaying bark of old or prostrate trees. Luxuriant specimens were gathered on fallen pods of *Parivoa excelsa*. I found it once intermixed with male plants of *C. integrifolia*, from which its olive-green catkins at once distinguished it; *C. integrifolia* having them white, besides a distinctly leafy stem.

The radicles originate in tubercles (of one or two cells) placed here and there on the underside of the costa; but even the tubercles are not developed unless radicles be needed for attaching the frond at that point. In the male spikes a few more cells are sometimes added on to these tubercles, which thus become underleaves, or bracteoles. The fronds, whether primary or secondary, often root also at the attenuated point.

Subgenus III. *ZOOPSIS*, Hook. fil. (genus).

Crypt. bot. Antarct. Voy. p. 55 (1846); Lindberg, Journ. Linn. Soc. (May 1872). R. S. in tract. cit. (1882).

Plantæ minutæ prostratæ cladocarpicæ, caule angusto frondiformi ad speciem (haud revera) aphyllo, laxe corticato, subradicelloso, paucirameo. *Folia* præminuta, sublongitudinaliter inserta 1–2-loba, lobis basi cellula singula (raro bina) magna constantibus, apice vel muticis vel cellula tenui unguiformi apiculatis. *Foliola* subnulla. *Bracteæ* foliis longe majores tristichæ bipartitæ, laciniis subulatis. *Perianthia* pro plantula maxima, distincte trigona vel fere teretia, apice constricto profunde laciniato. *Capsula* etc. omnino *Cephaloziæ*.

3. CEPHALOZIA MONODACTYLA, Spruce.

In sylvis ad fluvii *Negro* cataractas, in terra nuda, præcipue ad cumulos a vermibus magnis suffossos; necnon in *Lepidozia chætophylla* parasitans.

Rami 1–1·5^{mm} longi. Folia $\frac{1}{16}^{mm}$ longa. Caulis $\frac{1}{10}^{mm}$ latus. Cellulæ corticales, necnon foliares inferiores $\frac{1}{20}$, superiores $\frac{1}{80}^{mm}$. Bracteæ int. ·3–·4; perianthia 1·0 × ·2^{mm}.

Minutissima virescens, strato tenui effusa. Caules 5–10^{mm} longi filiformes flexuosi, parum et substellatim ramosi, trigono-prismatici (supra plani, subtus carinati), cellularum seriebus 5 conflati; cellulæ corticales vacuæ pellucidæ, anticæ biseriatæ magnæ sphæricæ (pres-

sione mutua angulatæ) posticæ biseriatæ angustæ rectangulari-oblongæ, axiales uniseriatæ tenuissimæ chlorophyllosæ subopacæ. Rami omnes caulis facie postica orti, alii flagellares radicellosi subaphylli.

Folia cellulis caulis binis dissita, distiche patentia, insertione exacte longitudinalia, cellulis solum 2, suprapositis (rarissime 1 vel 3) constantia; cellulæ pellucidæ parce chlorophyllosæ, inferior magna truncato-conica, superior 4plo minor incurva unguiformis, basi constricta.

Flores monoici: ♀ postici (ramulo brevissimo constantes). Bracteæ 1–2-jugæ 3-stichæ, perianthio subtriplo breviores, liberæ connatæve, profunde bipartitæ, sinu obtuso, laciniis subulatis elongato-cellulosis.

Perianthia pro plantula maxima, foliis caulinis 16plo majora (!) trigono-subulata, ore profunde 6-fida, laciniis ciliiformibus. Calyptra parva tenuis. Capsula oblonga.

Rami ♂ cæteris ramis æquilongi, assurgentes: bracteæ plurijugæ secundæ confertæ suberectæ subulatæ, cellulis 5–6 constantes, integræ bifidæve, monandræ. Bracteolas nullas vidi.

Obs. The leaves never want the terminal minute hooked cell, which is very mostly imposed on a truncato-conical cell of four times the size, these two cells constituting the entire leaf. But sometimes there are two (in lieu of only one) basal cells, and then the leaf becomes subulate. This brings it into relation with *C. micromera*, whose leaves (consisting of about ten cells) sometimes lose one of the two apical teeth, and thus from bifid they become entire and subulate; but in other respects, and especially in the inflorescence and the structure of the stem, they stand widely apart. The long filiform leaves, or leaf-crura, of *Arachniopsis* forbid the placing of *C. monodactyla* in that genus, although it obviously approaches it.

Subgenus IV. *ALOBIELLA*, Spruce, op. cit. (1882).

Plantæ mediocres albicantes, facie (nisi pro foliis succubis) magis *Kantiæ* quam *Cephaloziæ*. Caulis postice ramosus, ramique foliosi—raro flagellares. *Folia* fere longitudinalia, distiche patula, plana, integra—vel alia integra, alia apice bidentella—laxe pellucide reticulata; cellulæ majusculæ magnæve, subrectangulares, duplo longiores quam latæ. *Foliola* aliis speciebus præsentia, parvula, integra et bifida. *Flores* ♀ cladogeni; in unica specie acrogeni. *Bracteæ* profunde bifidæ; in unica *C. acroscypha* solum breviter 2–4-fidæ. *Perianthia* elongata, ab ipsa basi trigona, ore breviuscule fissa. *Andrœcia* vel spicata vel ad amenta postica redacta.

§ 1. *Foliola nulla.*

4. *C. integrifolia.* Dioica cladocarpa albicans nitens prostrata flagellifera. Folia fere longitudinalia subcontigua oblonga rotundata subtruncatave, rarissime apice bidentella, cellulis magnis oblongis. Br. bipartitæ, laciniis subulato-attenuatis. Per. alte emersa lineari-subulata trigona, ore breviter trifida, segmentis apice 2–3-ciliatis.

5. *C. macella.* Monoica, facie *C. bicuspidatæ* formis macrioribus valde similis, distincta foliis planis ovato-triangularibus-trapezoideisve, apice rotundatis, retusis, oblique acutis (i.e. unidentatis) vel deni ue truncato-bidentatis, cellulis elongatis; bracteis bifidis, segmentis longe subulatis; per. ore breviuscule trifidis, segmentis 2–3-ciliatis.

§ 2. *Foliola foliis adjecta.*

6. *C. acroscypha.* Dioica acrocarpa pusilla tenerrima prostrata flagellifera. Folia subimbricata subplana ovato-oblonga-lanceolatave obtusata—raro retusa vel apice 2–3-crenata—cellulis majusculis elongatis. Foliola parva—superiora increscentia—subulata integra bifidave. Br. emarginato-2–4-fidæ. Per. obtuse trigona, ore breviter 3–6-fida edentula.

7. *Husnoti.* Dioica cladocarpa, a basi procumbente flagelliferâ erecta; ramis fastigiatis, apice in sicco sæpe hamatis. F. contigua patula plana lanceolata subacuta—rarissime bidentula, cellulis majusculis elongatis. F^{la} duplo breviora, linearia, ultra $\frac{1}{2}$ bifida. Br. carinatæ, ad $\frac{1}{2}$ bifidæ, subdenticulatæ. Per. triquetro-prismatica, ore setulosa.

4. CEPHALOZIA INTEGRIFOLIA, Spruce.

Hab. In sylvis umbrosis fluvii *Negro*, supra cataractas, et fluvii *Uaupés* ubi in truncis prostratis putrescentibus, rarius ad aggeres umbrosos inter muscos, viget; etiam in Andibus Peruvianis super M. *Campana*, alt. 1000^{m}.

F ·4×·3 (*in pl. sterili* ·8×·5); *cellulæ* $\frac{1}{16}$–$\frac{1}{12}$; *br* 1·6×·6; *per* 2·5×·4, 3·0×·5^{mm}.

Majuscula albido-viridis, margaritaceo-nitens, strato tenui late effusa. Caules 1½-pollicares prostrati tenues subramosi, supra subplani, subtus convexi, strato corticali pellucido induti; cellulæ corticales 9–10-seriatæ compresso-cylindricæ, internæ 10-12-seriatæ triplo angustiores, sectione æquilateræ. Rami omnes postici, alii flagelliformes subaphylli radicelliferi.

Folia vel dissita, vel subimbricata, vel sæpissime valvatim contigua, longitudinaliter, vel (basi antica longius decurrentia) parum oblique inserta, oblonga rhomboideave, apice rotundata vel suboblique truncata, rarissime rudimentarie bidentata; inferiora superioraque sæpe sensim minora (unde rami elongato-lanceolati fiunt); cellulæ magnæ oblongo-hexagonæ leptodermes pellucidæ.

Flores dioici: ♀ postici, ramo brevi constantes. Bracteæ 3–4-jugæ, intimæ variabiles, foliis 2–4plo longiores, lanceolatæ, ad $\frac{4}{5}$ bipartitæ, basin versus angulatæ, laciniis a basi late subulatâ longe sensimque attenuatis.

Perianthia bracteas alte superantia, lineari-subulata-lanceolatave, trigona, ore breviuscule trifida, segmentis bi-trifidis, laciniis ciliiformibus inæqualibus. Capsula oblongo-cylindracea, duplo longior quam lata.

Amenta ♂ ramulo parvo constantia, albida, raro rami foliosi basin apicemve tenentia; bracteæ plurijugæ confertæ assurgenti-secundæ parvæ subquadratæ emarginatæ, utroque apice cellula unica magna sæpe apiculatæ, monandræ.

Obs. Plantæ foliis ex parte in frondem pinnatifidam plus minus alte connatis rarissime adveniunt.—Folium *incubum* inter normalia succuba interpositum aliquando invenitur. Cæterum, nostra plantula, quoad aspectum, *Calypogeiam* (*Kantiam*) potius quam *Cephaloziam* refert.

5. CEPHALOZIA MACELLA, Spruce.

Hab. In sylva Amazonica, prope *Santarem*, ad fl. *Tapajoz* ostia, super ligna putrescentia in palude; etiam ad *San Carlos del Rio Negro*.

F ·30×·20, ·25×·15; *c* $\frac{1}{16}$–$\frac{1}{12}$; br 1·0×·35; per 2·3×·35; androecia 1·8; br ♂ ·3mm.

Magnitudine *C. bicuspidatæ*, viridis, albicansve, tenuis, tenerrima, prostrata laxe intricata. Caules pollicares flexuosi ramosi radicellosi, raro flagelliferi, inferne, vel hic illic, subaphylli.

Folia subcontigua explanata oblique ovato-triangularia-trapezoideave, apice vel oblique acuta (i.e. unidentata), vel rotundata, vel retusa, vel denique truncato-bidentata; cellulæ majusculæ leptodermes elongatæ, rectangulari-hexagonæ, subchlorophyllosæ.

Flores monoici: ♀ postici, ramo brevi triquetro constantes. Bracteæ 3-jugæ, foliis 3–4plo longiores, intimæ ultra medium acute bilobæ, segmentis longe subulatis acutis integerrimis.

Perianthia prælonga, foliis caulinis 8plo longiora, angusta fere linearia, ab ipsa basi trigono-prismatica, ore breviuscule trifida, segmentis in cilia 2 vel 3 fissis.

Androecia ramum totum vel ex parte tenentia; bracteæ foliis subæquilongæ vel sat minores, plurijugæ, confertæ, assurgenti-secundæ, ad ½ fere bifidæ, sinu acuto obtusove, segmentis subulatis erectis.

6. CEPHALOZIA ACROSCYPHA, Spruce.

Hab. Andes Peruvianos, in declivibus arenosis umbrosis montis *Guayrapurina*, socia *Cephalozia Husnoti* (G.).

F ·35×·18; *c* $\frac{1}{16}$; *f*^{la} ·2×·08; *br* ·8×·55; *per* 1·2×·4; *cal* ·35; *caps* ·3×·25; ·25×·125mm.

Pusilla pallida tenerrima; caules $\frac{1}{6}$-pollicares prostrati, hic radicellis fasciculatis, illic flagellis albidis, matrici adfixi, divaricato-subramosi, ramis posticis.

Folia subimbricata late patula subplana, pellucida, ovato-oblonga-lanceolatave obtusata, raro retusula apiceve 2–3-crenata; cellulæ majusculæ elongatæ subrectangulares, limitibus validis non autem incrassatis, intus annulo endochromii perangusto cinctæ, subplanæ.

Foliola foliis fere duplo breviora subulata lineariave 4–5 c. longa, 1–3 c. lata, interdum bifida, haud raro amorpha obsoletave; superiora tamen increscentia sic uti in floris ♀ vicinia foliis solum paulo minora evadunt.

Fl. dioici: ♀ in caule ramove elongato terminales, innovatione nulla suffulti; bracteæ sub 3-jugæ, exteriores in folia caulina normalia sensim transeuntes, intimæ foliis 2plo longiores quadrato-oblongæ apice inæqualiter emarginato-bifidæ-quadrifidæve; bracteola æquimagna conformis magis symmetrica, cum bracteis subconnata liberave. Pistillidia 20.

Perianthia, alte emersa, foliis 3–4plo longiora, 3plo longiora quam lata, lineari-oblonga obtuse obscureque trigona, ore vix subconstricto, 3–4 fida, segmentis brevibus inæquilongis obtusulis. *Calyptra* 4plo fere minor pyriformis tenerrima, *sæpe basi circumscissa et cum capsula in pedicello longo alte exserta.* Capsula calyptra vix brevior, oblonga vel oblongo-globosa, vix longior quam lata, ad basin usque 4-valvis.

Amenta pl. ♂ caulis ramive apicem tenentia; bracteæ plurijugæ, foliis paulo minores, magis erectæ, a basi ad medium lobulo antico augusto lineari inflexo auctæ, 1-andræ. Bracteolæ adsunt.

Obs. Perianthium superne trigonum, angulo tertio *postico* nec antico ac in *Jungermania*; basi et perpaulo altius 3-2 cell. crassum, superne tenue.

7. CEPHALOZIA HUSNOTI (Gottsche).

Jungermania Husnoti G. in Husnot. Hep. Antillarum Exsicc. (1868). *J. lancifolia* nob. in hb. (1855).

Hab. In M. *Guayrapurina* Andium Peruviæ ad vias cavas, alt. 1000^{m} (R. S. Julio, 1855). Ins. *Martinica* (Husnot. pl. ♂).

F ·8 × ·3 (18 *cellulas longa*, 14 *lata*); *c* $\frac{1}{16}$—$\frac{1}{20}$ *longæ*, $\frac{1}{10}$ *latæ*; *f*^{la} ·4 × ·1, ·35 × ·1; *per* 1·0 × ·5^{mm} (*juvenilia*).

Late cæspitosa flavo-viridis pellucida. Caules $\frac{1}{2}$-pollicares, basi ipsa aphylla radicantes, dein decumbentes foliosi radicellosique, demum ascendentes suberective arhizi, flagella tamen valida e parte inferiore demittentes, vage subfastigiatim, raro subpinnatim v. flabellatim ramosi, ramique siccando sæpe apice incurvo-circinati, omnes (quoad insertionem) postici.

Caulis parum compressus, fere teres; stratum corticale e cellulis 8-seriatis magnis pellucidis; cellulæ internæ sub 8-seriatæ angustiores, in caulis sectione annulos indistinctos efformantes.

Folia plurijuga, paulo imbricata vel solummodo contigua, subassurgentia (siccando sæpe inflexo-secunda), patula (axi angulum sub 70° cum caule efformante) oblique inserta, succuba, suboblique lanceolata subacuta, integra integerrimaque, repanda, rarissime apice bidentula; cellulæ majusculæ, duplo longiores quam latæ, fere parallelogrammæ, planæ, subleptodermes, parum chlorophyllosæ.

Foliola foliis duplo breviora, linearia, caule angustiora, appressa, integra v. sæpissime ultra medium bifida, laciniis erectis subulatis inæquilongis.

Flores dioici: ♀ ramulo brevi postico constantes. Bracteæ sub 5-jugæ, extimæ minutæ squamiformes, intimæ foliis sublongiores, liberæ v. sæpius inter se alte connatæ, ad $\frac{1}{3}$ bifidæ, laxe complicatæ *carinatæ*, laciniis lanceolatis acutis recurvulis, medio margine utrinque angulatæ v. grosse subdenticulatæ; bracteola bracteis subæqualis minus complicata. Br. externæ sensim minores, ovatæ, integræ, bifidulæve, arcte imbricatæ.

Perianthia (valde juvenilia) triquetro-prismatica ore truncato subsetulosa. Pistillidia plurima (20+).

Species maxime singularis, perbella, facie fere *Schistostegæ!*

Subgenus V. *EU-CEPHALOZIA*, Spruce, op. cit. (1882).

Plantæ mediocres, raro pusillæ vel robustæ, virescentes, rarius fulvæ luridæve, interdum roseo pictæ. *Caulis* plerumque mollis et fragilis, rarius rigidulus, in planum simplex vel rarissime furcatus, postice plus minus ramosus, in paucis flagellifer. *Folia* oblique inserta, sæpe sat magna et lata, concava vel laxe complicata, margine integerrima, apice bifida; cellulæ pro m. majusculæ, pellucidæ, quadrato-hexagonæ quadratæve, sublævissimæ. *Foliola* (paucis sp. normalia) parva, integra bifidave. Flores dioici vel monoici, ♀ in aliis speciebus constanter cladogeni, in aliis nunc clado-nunc acrogeni; vel omnes fere acrogeni nec raro in ipso caule terminales. *Bracteæ* intimæ sat magnæ, 2–4-fidæ, integerrimæ vel persæpe dentatæ, spinulosæ incisæve. *Perianthia* fusiformia—interdum fere linearia—trigono-prismatica, ore constricto denticulata, setulosa, ciliata vel laciniata. *Capsula* plus minus oblonga, cæteraque ac in

prioribus subgeneribus. *Andrœcia* spicata vel amentiformia, varie posita; rarissime tamen hypogyna, bracteis ♂ scil. florem femineum proxime sequentibus.

§ *Foliola caulina præsentia.*

8. *C. micromera.* Dioica cladocarpa minuta prostrata flagellifera. Caulis plano-convexus, cellulis corticis 6-seriatis, internis 4-seriatis, conflatus, subramosus. F. subimbricata cuneato-quadrata ad ½ acute bifida vel integra; segmentis subacuminatis, antico minore (sæpe deficiente). F^{la} ad tuberculum cellulâ unicâ, vel 2 collateralibus, constantem redacta. Br. bipartitæ, laciniis lanceolato-subulatis, altera interdum obsoleta. Per. magna ovato-subulata obtuse trigona, ore in lacinias tenui-subulatas profunde fissa.
9. *C. Serra.* Dioica cladocarpa efflagellifera. Caulis plano-convexus, cellulis corticalibus 6-seriatis, internis 5-seriatis, conflatus, subramosus. F. contigua plana ovato-quadrata breviter bifida, sinu acuto lunatove, apicibus rectis acutis. F^{la} foliis 3plo brevioribus oblato-quadrata emarginato-truncata. Br. ultra ½ bifidæ, laciniis lato-subulatis. Per. magna subulata superne obtuse tricarinata, ore 6-fida, laciniis capillaceo-acuminatis.

§ 2. *Foliola (præter ad florescentias) normaliter nulla.*

10. *C. Crossii.* Monoica, formis *C. bicuspidatæ* tenellis primo visu sat similis, diversa autem flagellorum defectu; foliis angustioribus ultra ½ bifidis, laciniis lanceolatis tenuiacuminatis; præsertim perianthio ore ciliis 7–8 cellulas longis insigniter fimbriato.
11. *C. forficata.* Dioica, *C. conniventi* Dicks. proxima, distincta foliorum sinu orbiculari, segmentis falcato-incurvis apice tenui forficatis; bracteis solum bilobis, liberis; perianthio cylindrico tereti, apice solo obsolete 3-vel 6-plicato, ore longiciliato; denique florescentia.

8. CEPHALOZIA MICROMERA, Spruce.

Hab. San Carlos del Rio Negro, in terra umbrosa humida.

Rami 1–2^{mm} *longi*; *f* ·15×·1; *c* $\frac{1}{25}$; *br* ·5–·7; *per* 1·8×·4; *caps* ·35×·15^{mm}.

Minuta prostrata viridis; caules 3–4^{mm} longi, intricato-ramosi, interdum subpinnati, radicellosi, parum flagelliferi, sæpe autem apice elongati vermiculares dissitifolii vel fere nudi; supra plani vel concavi, subtus convexi; cellulis corticis 6-seriatis majusculis pellucidis, axis 4-seriatis parvis subopacis.

Folia subimbricata contiguave, basi obliqua (angulo sub 45°) inserta, subpatentia, cuneato-quadrata, ad medium acute bifida, segmentis subacuminatis acutis, antico minore, sæpe minuto, vel omnino nullo (quando folium triangulare acuminatum evadit); cellulæ subglobosæ vel parum elongatæ, mediocres, cujusque folii circiter decem.

Foliola ad tuberculum rhizinophorum, cellulâ unicâ (raro 2) constans, redacta.

Flores dioici: ♀ ramulo brevissimo constantes. Bracteæ trijugæ tristichæ, intimæ foliis 4plo longiores erecto-appressæ bipartitæ, segmentis lanceolato-subulatis integerrimis; una alterave bractea (postica præcipue) sæpe integra, nec bifida.

Perianthia alte emersa tenera ovato-subulata obtuse trigona incurva,

ore parum constricto 6-laciniata, laciniis subulato-attenuatis. Capsula 5plo brevior, anguste ovalis.

Amenta ♂ ramum totum tenentia; bracteæ plurijugæ, foliis æquimagnæ, magis confertæ, erectiores, segmentis longioribus; bracteolæ rudimentariæ.

C. monodactyla S., foliis minutissimis, ad cellulas 2 (raro 3) redactis; caule cellulis solum 5- (nec 10-)seriatis conflato; denique florescentia monoica differt.—*C. pygmæa* S., florescentia monoica; foliis distantibus, semper profunde bifidis, segmentis subulatis; cellulis duplo vel fere triplo minoribus; bracteis denticulatis spinulosisve bene distincta.

9. CEPHALOZIA SERRA, Spruce.

Hab. Panuré fluvii *Uaupés*, supra ligna in humidis; etiam ad fl. *Negro* cataractas in "caatingas."

F ·3×·3; f^{la} ·1 × ·125; *c* $\frac{1}{24}$–$\frac{1}{20}$; *br. int.* 1·5 × 1·5; *per* 3·0 × ·5^{mm}.

Cespites lati implexi, e viridi olivacei. Caules prostrati semipollicares vage ramosi, ramique semicylindrici, supra plani 2 cellulas lati. Stratum corticale caulis e cellulis 6-seriatis majusculis pellucidis formatum, seriebus nempe 2 anticis, 4 posticis; cellulæ internæ minores, in series 5 longitudinales dispositæ.

Folia longitudinaliter inserta, plana, exacte contigua v. perpaulo imbricata (itaque frondem continuam margine serratam simulant), ovato-quadrata, 7 cellulas longa, 8 cellulas lata, breviter bifida, sinu acuto lunulatove, apicibus rectis acutis; cellulæ subæquilateræ, 6-gonæ v. subquadratæ.

Foliola parva subsquarrosa, foliis 3plo breviora, oblato-quadrata emarginato-truncata, sæpe ad limbum vix conspicuum redacta vel etiam obsoleta.

Flores dioici: rami ♀ breves basi dense radicellosi. Bracteæ sub 3-jugæ, intimæ (2 laterales) foliis 5plo majores, appressæ, cuneatæ, ultra medium bifidæ, laciniis lato-subulatis, integerrimæ vel utrinque medio margine angulatæ, elongate cellulosæ; intermedia (bracteola) paulo brevior; br. 3 extimæ minutæ emarginatæ; 3 mediæ magnitudine formaque intermediæ.

Perianthia bracteis duplo longiora, subulata v. fere linearia, sæpe hamata, superne obtuse triplicata, ore 6-fida, laciniis capillaceo-acuminatis. Capsula oblonga, vix duplo longior quam lata.

Plantæ ♂ amenta ramos fere totos occupantia; bracteæ plurijugæ, foliis concolores, vix minores, subtransversæ, confertæ, secundæ, monandræ, subquadratæ, sinu triangulari fere ad medium bifidæ, concavæ, nonullæ lobulo antico dentiformi auctæ, monandræ v. sæpissime vacuæ. Adveniunt etiam (sed rarius) amenta postica parva albida, bracteis paucijugis teneris monandris.

10. CEPHALOZIA CROSSII, Spruce.

Hab. Andes Bogotenses, in rivuli arena juxta *Popayan*. Legit ROB. CROSS, a. 1877. Ejusdem *Cephaloziæ*, ut videtur, caules perpaucos steriles, cum *Jungermania heteracria* S. mixtos, prope *Tarapoto*, a. 1856, legi.

Formis *C. bicuspidatæ* L. minoribus sat similis differt stolonibus nunquam aphyllis et radicantibus; foliis angustioribus ultra ½ bifidis, segmentis lanceolatis sensim tenui-acuminatis—vel antico angustiore

subulato, cellulis paulo angustioribus, $\frac{1}{24}$–$\frac{1}{20}$ mm longis ; bracteis semper solum bifidis fere integerrimis ; perianthiis lineari-oblongis obtuse trigono-prismaticis, ore truncato hiante vel subconnivente *longiciliatis*, ciliis ad 7–8 cellulas longis ; capsula breviore, oblonga vix subcylindrica.

Cæspites densi intricati olivaceo-virides. Rami fertiles interdum elongati. Flores monoici : andrœcia medio caule ramove posita, foliis caulinis consecutiva, iis *C. bicuspidatæ* conformia.

11. CEPHALOZIA FORFICATA, Spruce.

Hab. In Andibus Peruvianis, alt. 1000–1300m, in ipsa terra supra M. *Campana*, in lignis putridis M. *Guayrapurina*.

F ·55 × ·5 (*basi*) × ·4 (*ad sinum*) ; *c* $\frac{1}{20}$–$\frac{1}{16}$; *br* ·8 × ·6 ; *per* 2·0–2·5 × ·65, *cilia* 5mm.

Pusilla pallide viridis prostrata, post siccationem difficillime emollitura. Caules pollicares flexuosi vage subramosi radicellosi eflagellares, compressi biconvexi, sectione ovali ; cellulæ 3-stratæ, extimæ (corticales) sub 8-seriatæ, interiores duplo angustiores, strati subcorticalis 8-vel 7-seriatæ, axiales circiter 5-seriatæ.

Folia basi latâ fere longitudinali inserta, antice decurrentia, contigua vel leniter imbricatula, patula plana, suboblique oblongo-rhombeove-rotunda, apice ad $\frac{1}{3}$ altitudinis usque emarginato-bidentata, sinu lunari vel sæpius orbiculari, dentibus falcato-conniventibus, apice tenui peracuto conniventi-contiguis vel etiam forficato-imbricatis ; cellulæ majusculæ subæquilateræ crassiusculæ leptodermes, fere vacuæ, marginales (anticæ præcipue) cæteris submajores, apicales minutæ conicæ.

Flores dioici : ♀ in ramo perbrevi terminales. Bracteæ trijugæ tristichæ, intimæ multo majores, folia caulina dimidio excedentes, subappressæ, liberæ, oblongæ, ultra medium bilobæ, segmentis sensim acuminatis, laterales hinc, media (bracteola) utrinque medio margine dente obtuso auctæ.

Perianthia alte emersa, bracteas triplo superantia, cylindrico-tubulosa, apice solo obsolete 3-vel 6-plicata, ore abrupte constricto longiciliata ; ciliis longitudine foliorum caulinorum, cellulis 3 vel 4 uniseriatis linearibus, constantibus.

Andrœcia rami medium apicemve tenentia ; bracteæ foliis subminores plurijugæ erecto-appressæ concavo-canaliculatæ ad medium bifidæ, segmentis subacuminatis, monandræ. Adveniunt plerumque bracteolæ parvæ, lineares amorphæve, cellulis sub 6 biseriatis constantes.

Jung. Sandvicensis Mont. (= *J. crassifolia* L. et G.) differt a *C. forficata* rigiditate, foliis ad $\frac{1}{2}$ usque bilobis, lobis tenui-acuminatis pungentibus fere constanter strictis (nec conniventibus) ; perianthiis brevioribus tota fere longitudine obtuse trigonis, ore 12-ciliatis.

"*Jungermania connivens* Dicks." (in Hookeri icone : Brit. Jung. tab. 15) cum nostra convenit perianthio longiciliato et foliorum sinu late lunulari ; insigniter discrepat autem florescentia monoica ; bracteis connatis et digitatim 3–5-fidis, et perianthiis anguste obovatis ; necnon foliorum segmentis (dentibusve) latioribus apice conniventibus nunquam tamen contiguis nec forficatis.

Jungermania multiflora Spruce. (="*J. connivens* Dicks." auctorum omnium fere recentiorum) folia habet minora, magis orbiculata, sinu

obtuso raro lunulari, segmentis conniventibus suberectisve, latioribus (antico basi 2–3-cell., postico 3–5-cell. lato), cellulis paulo minoribus; bracteas foliis 3–4-plo majores sæpe in excipulum alte connatas; perianthia lineari-oblonga, ore solumdenticulata setulosave, setulis 1 vel 2 cellulas parvas constantibus.

Subgenus VI. *CEPHALOZIELLA*, Spruce, in op. cit.

Plantæ pusillæ minutæve, sæpe supra muscos, vel alias hepaticas reptantes. *Caulis* pro plantula sæpissime validus, cellulis corticalibus internis homomorphis, basi in plerisque subrhizomatosus, flagellis autem orbatus; *rami foliosi* in omnibus fere postici, in perpaucis ex parte—in paucissimis normaliter—laterales. *Folia* inferiora succuba, superiora magis conferta et transversa, caulis latitudinem raro excedentia, persæpe cuneata, ad vel ultra ½ bifida, carinata, segmentis vel subcomplicatis vel divergentibus, integerrima subdenticulatave, raro spinulosa; cellulæ parvæ vel minutæ (diam. $\frac{1}{50}$–$\frac{1}{70}$ mm) subquadratæ. *Foliola* (ubi adsunt) parva, integra bifidave, sæpe in una et eadem specie nunc præsentia nunc obsoleta. *Flores* ♀ persæpe in ipso caule terminales, in aliis sp. cladogeni vel situ variabili. *Bracteæ* sat magnæ, tristichæ, bilobæ, lobis in plerisque denticulatis spinulosisve, laterales persæpe cum postica in cyathum alte connatæ. *Perianthia* plerumque angusta, acute prismatica, carinis raro solum 3, sæpius 3, 4, vel 5 (raro etiam 6) in eadem specie, ore denticulato raro mutico. *Capsula* oblongo-globosa. *Andrœcia* ipsius caulis, ramive majoris, partem sistentia, medialia apicaliave, bracteis foliis consecutivis haud minoribus, rarissime ad ramulum tenuem amentiformen redacta.

12. CEPHALOZIA PYGMÆA, Spruce.

Hab. Andes Peruvianos in M. *Campana*, ad terram umbrosam, alt. 1200m.

F ·1–·125mm *longa*, *basi 4 cell. lata*; *c* $\frac{1}{70}$–$\frac{1}{60}$; *br* ·3; *per* ·8 × ·2mm.

Minuta fuscidula prostrata; caules 4mm longi, vage subramosi, tenues opaci flexuosi parum radicellosi, flagellis nullis.

Folia distantia, a basi plus minus obliqua v. fere transversa, subsquarrose patula, plana, cuneata, profunde bifida, sinu acuto (30°–40°), cruribus subulatis subacutis basi 2 cell., apice 1 cell., latis, integerrima; cellulæ minutæ subparallelogrammæ subchlorophyllosæ, leptodermes.

Foliola nulla, nisi ad involucra.

Flores monoici: ♀ ramulo brevi tristiche folioso constantes, sæpe e rami ♂ facie postica orti, haud raro fasciculato-2–3ni; bracteæ 3-jugæ liberæ v. sæpius alte coalitæ, intimæ foliis fere 3plo longiores, ad dimidium solum bifidæ, laciniis acuminatis recurvis, subdenticulatæ.

Perianthia alte emersa, magna, lineari-trigona, 4plo longiora quam lata, ore subconstricto setoso-denticulata demum breviter 6-fida.

Amenta ♂ caulis ramive apicem mediumve tenentia; bracteæ foliis continuæ, iisdem similes, paulo breviores latioresque, plurijugæ, assurgenti-imbricatæ suberectæ conduplicato-concavæ, monandræ; bracteolis minutis subulatis adjectis. Raro advenit amentum ♂ ad ramulum parvum redactum.

Var. *spinuliflora* S. Folia sublatiora, lobo antico basi sæpe 4 cellulas, postico 3 cell., lato, integerrima vel dente uno alterove obtuso armata. Bracteæ ad ½ usque connatæ, spinuloso-serratæ, viridissimæ.—In sylva Amazonica, ad fl. Uaupés, in *Lejeunea porelloide* parasitans.

Obs. A *C. divaricata* certe distat minutie, florescentia monoica, foliorum segmentis perangustis, etc.

Subgenus VII. *ODONTOSCHISMA*, Dumort. (genus).

Recueil, (1835); Lindberg, Not. F. et F. Fennica (1874); Spruce, Journ. Bot. (1876) et Tract. de *Cephalozia* (1882).

Plantæ sat robustæ, virides luridesve, interdum roseæ, raro albidæ, in plagas latas unistratas arcte intricatas effusæ, vel super muscos palustres reptantes iisdemque persæpe in cespitem densum implexæ. *Caules* validi subteretes, vel prostrati vel per saltus arcuantes et a matrice liberi, ad nodos descendentes ope flagellorum radicantes; ramis foliosis posticis, cauli conformibus. *Cellulæ* in caulis diametro sub 8, corticales 20–22-seriatæ internis conformes et concolores. *Folia* basi diagonali vel fere longitudinali inserta, late ovata vel suborbiculata rotundata, retusa, vel rarius emarginata, pro m. concava et integerrima; cellulæ mediocres—minutulæ, æquilateræ, cuticula plerumque scaberula. *Foliola* vel nulla vel minuta et rara. *Flores* ♀ cladogeni; *bracteæ* tristichæ, bifidæ, raro 3–4-fidæ. *Perianthia* magna angusta, ore ciliata denticulatave, interdum clausa et rima laterali dehiscentia. *Capsula* cylindrico-oblonga cæteraque omnia *Eucephaloziæ*. *Andrœcia* amentis parvis albidis posticis constantia, rarissime robustiora et terminalia.

§ 1. *Flores dioici.*

13. *C. Sphagni.* Dioica, caule elongato subæquifoliato, ope flagellorum arcuato-radicante, ramis gemmiparis nullis. F. patula vel secunda, ovato-rotunda-oblongave, rotundata retusulave subconcava opacula, cellulis mediocribus. F^{la} nulla vel perrara, minuta ovata integra bifidave.

14. *C. denudata.* Priori proxima, subminor. Caulis basi subaphyllus, rhizomatosus, flagella villosissima demittens, deinde subramosus, ramique alii arcuati, utroque fine parvifolii, alii erecti superne sensim minutifolii et gemmipari. F. late ovata subpellucida. F^{la} ubique obvia, ad ramos gemmiparos superne increscentia, late ovalia integerrima v. subdenticulata.

§ 2. *Flores monoici.*

15. *C. obcordata.* Humilis cladocarpa eflagellifera, caule elongato prostrato subramoso. F. parva, fere longitudinalia, subcontigua planiuscula obcordato-rotunda, cellulis minutulis. Andrœcia postica amentiformia, subramosa, axi primaria sola mascula, aliis ramulis femineis, aliis neutris.

13. CEPHALOZIA SPHAGNI (Dicks.), Spruce.

Jungermania Sphagni Dicks. Crypt. Brit. (1785); Hook. Brit. Jung. t. 33, ex p.—*Sphagnoecetis communis v. vegetior* Nees in Syn. Hep.—*Odontoschisma Sphagni* (Dicks.) Dum.; Lindberg Not. Soc. F. Fl. Fenn. (1874); Spruce, Journ. Bot. (1876).

Hab. In ericetis turbariis totius Europæ Americæque borealis temperatæ, Sphagnis et præcipue Lencobryo glauco irrepens. In sylvis umbrosis humilioribus fl. Amazonum, præcipue secus ejus tributarios

boreales, *Rio Negro*, *Trombetas*, &c., necnon per totam regionem graniticam fluminum *Orinoco*, *Casiquiari*, *Uaupés*, &c., ad arborum pedem radicesque exsertas, raro ad truncos putrescentes, sæpe aliis hepaticis muscisque consociata easdemve infestans.

F ·75×·65, ·8×·7 ; *c* $3\frac{1}{3}$; *br. int.* ·8×·35, 1·1×·5 ; *per* 2·3×·7, 2·5×·5, 2·0×·4 ; *cal* 1·0×·5 ; *caps. valv* ·8×·25–·3 ; *br* ♂ ·4×·2^{mm}

Prostrata, in plagas latas tenues effusa, vel super muscos palustres reptans, viridis, albescens roseave. Caules pollicares longioresque, tota fere longitudine æquifoliati, basi ipsa radicellis sæpeque flagellis radicantes, postea sursum arcuantes matriceque liberi, flagello demisso (raro 2 v. 3) *iterum iterumque radicantes arcuantesque* ; e facie postica ramos æquifoliatos, sæpe subdivisos, paucos—parvifolios gemmiparos nullos—emittentes ; cæterum plus minus radicelliferi, raro arhizi. Flagella sat valida alba flexuosa omnino aphylla, radicellis trichoideis sparse densiusve vestita.

Folia arcte (ad $\frac{1}{2}$) imbricata, plus minus patentia vel sæpe assurgentisecunda, basi subobliqua, longitudinali fere, inserta, antice perpaulo decurrentia, suboblique ovato-rotunda vel late ovato-oblonga, rotundata raro truncato-retusula, e margine toto incurvulo subconcava, cellulis incrassatis marginata, integerrima ; cellulæ mediocres rotundohexagonæ v. subquadratæ, ad angulos incrassatæ, minutissime verruculosæ, ex endochromio copioso opacæ, solum ipso centro pellucidæ, foliorum vetustorum evacuatæ.

Foliola præminuta, ad squamulam ovatam integram bifidamve redacta, hic illic sed præcipue ramorum apicem versus obvia, sæpe tamen obsoleta nullave.

Flores dioici, postici. Ramuli ♀ breves tristichophylli ; bracteæ subtrijugæ, interiores sensim majores, arcte imbricatæ, apice recurvulæ cuneato-oblongæ, fere ad medium acute bifidæ, laciniis subinæqualibus acutis integerrimis, oblongato-pellucido-areolatæ (aliorum florum tamen magis opacæ) ; bracteola intima sæpe basin versus dente lobulove aucta, cæterum bracteis conformis.

Perianthia foliis caulinis triplo longiora, albida subroseave, anguste fusiformia subulatave, sæpe subfalcata, obtuse trigona triplicataque, ore denticulata vel subciliata, vel valvatim vel (rarissime) circumscissim rupta. Calyptra perianthio plus duplo brevior, pyriformis, vel latior et obovato-globosa, tenuissima, cellulis unistratis valde inæquilateri-3–7-gonis pellucidis areolata, apice demum rupta laceraque, basi pistillidiis sterilibus ad 20 obsita.

Capsula calyptra paulo brevior, pedicello elongato suffulta, cylindrico-oblonga, ab ipsa basi 4-valvis valvulis inæquilatis rufo-badiis validis.

Amenta mascula e caulis facie postica, basin mediumve versus orta, tenuia, albida, pellucida, incurva circinnatave. Bracteæ 10–12-jugæ, arcte imbricatæ, apice tamen patulæ, subsecundæ, ovato-oblongæ-ligulatæve, cymbiformi-concavæ, ad $\frac{1}{4}$ acute bifidæ, segmentis obtusis. Antheridia solitaria magna globosa brevipedicellata, demum a basi ad apicem usque hinc hiantia. Bracteolæ ubique obviæ, bracteis duplo breviores lineari-ligulatæ, apice bispinulosæ.—Unicum exemplum inveni caulis primarii apice in spicam masculam robustam viridem commutati !

Var. *Europæa:* perianthiis apice valvatim dehiscentibus, valvulis (sub 6) plus minus incisis ciliatisque.

Var. *Amazonica :* perianthiis apice integerrimo v. parum fimbriato con-

niventi-clausis, pro capsulæ emissione rima infra-apicali dehiscentibus, raro circumscissis v. valvatis.

14. CEPHALOZIA DENUDATA (Mart.).

Jungermania scalaris B *denudata*, Mart. Fl. Crypt. Erlang. (1817); *Pleuroschisma* (*Odontoschisma*) *denudatum* Dum. Syll. Jung. Eur. (1831); *Jungermania Sphagni* Hook. Br. Jung. Suppl. t. 2; *Odontoschisma denudatum* (Mart.) Lindberg, Not. Soc. F. Fl. Fenn. (1874); Spruce, Journ. Bot. (1876).

Hab. Ad arbores excisas et truncos prostratos putrescentes, rarius in ipsa terra turfosa saxisque vel in muscis reptantes, in montibus humilioribus totius fere Europæ et Americæ borealis, in Andibus rarissime (vide infra).

F ·85 × ·8; *c* $\frac{1}{40}$; *f*^{la} *superiora* ·5 × ·4; *br*$^{la}_{s}$ *int.* ·9 × ·5; *per* 2·4 × ·5^{mm}.

Ceph. Sphagni primo visu sat similis, paulo humilior, persæpe rubescens, colore magis in purpureum vel etiam in violaceum vergente (nec rubro-miniato sicut in *O. Sphagni*). Caudex brevisculus, prostratus aphyllus, totus intricato-ramosus radicellosus, insuperque flagellis validis radicellis villosissimis matrici adfixus. Caules vix pollicares *assurgentes* arcuantes, arhizi, rarissime apice flagelliformi radicantes, subramosi; rami sæpe fasciculati, alii (normales) caulesque basi plus minus aphylli deinde, foliis ad medium usque sensim crescentibus, apicem versus simili modo decrescentibus, vestiti, ex quo rami (semper oligophylli) ambitu lineari-lanceolati evadunt; alii rami erecti superne sensim parvifolii apice gemmipari.

Folia eadem fere forma ac *O. Sphagni*, oblique late ovata vel ovato-rotunda, raro retusa subemarginatave, antice obscure decurrentia, subconcava, assurgentia—non tamen secunda ad *O. Sphagni* instar—pellucidiora; *cellulæ* fere eadem magnitudine magis tamen incrassatæ, cavitate minore ambitu distincte 6-sinuata, endochromio parciore, externe parum verruculosæ. Folia surculorum gemmiparorum suberecta subrotunda, apice varia, rotundata, subacuta, erosave.

Foliola ubique fere obvia, ad caules minuta ovata squamæformia, ad surculos gemmiparos insigniter aucta, superiora foliis adjectis æquimagna—sæpe foliis caulinis mediis vix duplo minora—ovali-rotunda, subintegerrima.

Flores dioici, iis *O. Sphagni* parum diversi, bracteæ fl. ♀ intimæ foliis mediis æquilongæ, apice recurvo-squarrosæ, bifidæ, integerrimæ v. denticulatæ.

Perianthia foliis 3-plo longiora, anguste fusiformia, trigona, pallida sæpe infra medium purpureo-zonata, apice conniventi-clauso breviter fimbriata, demum irregulariter rupta, cellulis elongatis pachydermibus lævissimis conflata. Calyptra plus duplo brevior, pyriformis, tenuis, demum bilabiatim rupta, basi et perpaulo altius pistillidiis sterilibus circumdata. Capsula. . . . .

Amenta ♂ in planta propria, e caulis facie postica orta, albida tenera julacea, subrecta decurvave, nunquam circinnata; bracteæ pauci-vel sæpe multi-(ad 20-) jugæ, iis *O. Sphagni* sat similes.

Var. *andina*. Pulchre roseo-purpurea, sterilis. Cum planta Pyrenaica bene convenit, solum differt foliolis sæpe apice erosulis v. etiam bifidulis biciliatisve. Ad surculos gemmiparos assurgentes folia

superiora sensim minora, foliolis subrotundis vix majora, iis plantæ nostratis accurate convenientia.

Hab. M. *Campana* Andinum Peruvianorum, ad terram humidam sub Ericearum umbra, sociis *Jungermania heteracria*, Spruce, et *Sphagno Peruviano*, Mitt.—In Andibus nusquam alibi—in planitie Amazonica nullibi—inveni.

15. CEPHALOZIA OBCORDATA, Spruce, op. cit. (1882).

Hab. in arborum imis truncis fl. *Casiquiari* inundatis.

F ·35 × ·4, ·35 × ·3, ·3 × ·3 ; *c* $\frac{1}{60}$–$\frac{1}{50}$; *br* ♀ ·35–·4 ; *br* ♂ ·2 ; *br. steriles* ·35–·4^{mm}.

Pusilla pallide viridis, strato tenui late effusa. Caules ½–1-pollicares, prostrati virides opaci validiusculi subteretes, minute radicellosi, e facie postica parum ramosi, ramique sæpe apice attenuato subaphyllo radicantes, flagellis propriis autem nullis. Cellulæ in caulis diametro sectione 7 vel 8 ; externæ (corticales) pluri-(ad 22-) seriatæ, opacæ incrassatæ ; interiores externis æquimagnæ vel etiam latiores, leptodermes pellucidæ.

Folia contigua vel subdissita, patulo-recurvula rarius subassurgentia, suboblique obcordato-rotunda obovatave, ad insertionem obliquam vel fere longitudinalem paulo angustiora ; cellulæ minutulæ, quadrato-rectangulari ve-hexagonæ, subopacæ, centro pellucidæ, endochromio parco, extus parum prominulæ verruculosæque. Foliola nulla.

Flores monoici : ♀ vel ramulo brevi proprio, e caulis facie postica exeunte constantes, vel ad spicam ♂ axillares : nempe ramulum e bracteæ ♂ axilla ortum sistentes. Bracteæ ♀ vix plures quam bijugæ, foliis caulinis subæquilongæ, recurvo-patulæ ovales breviter bifidæ—subinde trifidæ vel bis bifidæ—lobis acutis, hinc vel utrinque cum bracteola lanceolata ligulatave basi connatæ.

Andrœcia amentis posticis, sæpe incurvis, semper fere ramosis, constantia. Bracteæ primariæ sub 12-jugæ, foliis duplo fere minores, orbiculatæ concavæ raro retusæ, julaceo-imbricatæ ; bracteolæ nullæ ; antheridia solitaria. Rami sunt alii fœminei ; alii neutri quorum folia (s. bracteæ steriles) erecto-reflexa canaliculato-equitantia, elongata, oblonga, apice obcordata bifidulave.

Stirps singularis, facie formam *Odontoschismatis Sphagni* parvulam mentiens, flagellorum defectu distincta. Florescentia quasi-gynandra etiam in *Cephalozia bicuspidata* interdum invenitur.

XVII. ADELANTHUS, Mitt.

Journ. Linn. Soc. (1864) ; Spruce, Journ. Bot. (1876).

Plantæ cæspitosæ, pallidæ vel lurido-virides. *Caules* validi, e caudice repente ramoso radicelloso suberecti, apice sæpius decurvi, simplices vel parum ramosi, prope basin autem flagella postica minutifolia radicellifera demittentes. *Folia* succuba—præter ad basin anticam decurrentem fere transversim inserta—sat magna, alterna (in unica specie opposita ?) oblique rotunda ovatave, decurvo-

secunda, margine antico incurvo subintegerrimo, postico subplano sæpissime spinuloso-dentato; cellulæ majusculæ—minutulæ, guttulatæ, pachydermes, trigonis angularibus conspicuis, inferiores medianæ cæteris 2–5plo longiores, discolores, in vittam dispositæ, marginales minutæ opaculæ. *Foliola* nulla vel perrara et minuta. *Flores* dioici, utriusque sexus cladogeni, postici. *Bracteæ* ♀ tristichæ, intimæ foliis subminores, apice bifidæ vel varie incisæ. Pistillidia 12–15. *Perianthia* pyriformia fusiformiave, turgida, 3–5-angula, ore denticulato. *Calyptra* paulo minor, carnosa, infra medium 3–6-strata, ibidemque pistillidiis sterilibus obsita. *Capsula* ovalis, 4-valvis, bistrata, cæteraque eadem fere ac in *Cephalozia*. *Andræcia* amentiformia; *antheridia* solitaria, rarissime bina.

Hab. ad rupes umbrosas et arborum truncos vetustos prostratosve.

Distr. Paucæ species adhuc cognitæ in montibus tropicis, necnon in terris subantarcticis vigent; unica Britannica, *A. decipiens* (Hook.) etiam in Antillis et in Andibus Quitensibus inventa est.

Plagiochila Dum., habitu et foliis decurvis spinosis simillima, revera distinctissima foliis basi antica constanter recurvis (nec incurvis); perianthiis a latere compressis, macrostomis, bilabiatis; pistillidiis abortivis a calyptra liberis, &c.—*Cephalozia* subg. *Odontoschisma*, magis affinis, distat foliis assurgentibus (nec decurvis) pro more integerrimis; perianthiis constanter angustis et trigono-prismaticis; calyptra parva, tenui, solum in ipsa basi pistillidiifera, &c.

§ 1. *Folia integerrima.*

1. *A. Crossii.* F. subrotunda, evittata, antice longe decurrentia. Br. apice integræ vel 2–3-lobæ et subciliatæ, cum bracteola ovata bifida ciliata connatæ.

§ 2. *Folia apice margineque postico spinulosa.*

2. *A. decipiens.* Luride viridis. F. oblique orbiculata, antice longe decurrentia, basi obscure vittata, margine spinis paucis (1–3) armata. Br. foliis subminores, bifidæ subintegerrimæ. Per. pyriformia turgida superne obtuse 3–5-gona. Cal. 3-strata.
3. *A. decurvus.* Albicans. F. oblique ovato-rotunda brevissime decurrentia, apice et margine postico argute spinuloso-dentata (dentibus 15–20). Br. foliis æquales, apice varie lobatæ et ciliatæ. Per ovato-fusiformia, obtuse 3–5-carinata. Cal. 4-strata.

1. ADELANTHUS CROSSII, Spruce.

Hab. In Andibus prope *Popayan*, in rivuli arena, cum muscis, legit cl. Rob. Cross, a. 1877.

F 2·0 × 1·5, *c* $\frac{1}{30}$–$\frac{1}{28}$; *br* 1·0 × ·9^{mm} (*et latiores*).

Caudex repens brevis radicellifer subaphyllus, caules (plerumque solitarios) suberectos pollicares apice subuncinatos proferens. Stolones

e caudice et juxta caulis basin proferuntur, alii assurgentes foliosi alii decurvi microphylli radicantes.

Folia pauca inferiora minuta distantia rudimentaria, cætera majora, subæquimagna, laxe imbricata—stolonum dissita—decurvo-subsecunda accumbentia, interdum apice reflexa, subrotunda vel oblongo-rotunda, apice rotundato vel rotundato-truncata, subconcava, basi antica longe decurrentia, margine incurvo, postica late abrupte rotundata vel subsemicordata, margine repanda; cellulæ mediocres subæquilatero-hexagonæ conformes, (marginales autem quadratæ) chlorophyllosæ, pariete ad angulos incrassato.

Flores dioici: ♀ caulis basin versus laterales, solitarii vel fasciculati. Bracteæ tristichæ, 3–4-jugæ, in gemmam ovoideam imbricatæ, extimæ minutæ, intimæ foliis duplo breviores, laterales sæpe latiores quam longæ, altera (saltem) 2–3-loba, apice inæqualiter ciliato-fimbriatæ, inter se et cum bracteola intermedia ovata bifida ciliata basi plus minus alte connatæ; omnes bracteæ albidæ teneræ laxe subrectangulari-areolatæ pellucidæ. Pistillidia ad 25, robusta ovato-subulata truncata.

Perianthia etc. haud visa.

A. magellanicus Lindenb. !, ad fretum Magellanicum ab Hook. fil. lectus, diversus est foliis triplo brevioribus, oblatis (·6 × ·75^{mm}), parum decurrentibus, media basi cellulis longioribus vittatis.

2. ADELANTHUS DECIPIENS (Hook.), Mitt.

Spruce in Journ. Bot. 1876.

Jungermania decipiens, Hook. in Engl. Bot., t. 2567 (1813); ejusd. Brit. Jung., t. 50; *Plagiochila decipiens*, Dumort. Rec., 1, 15 (1835); G.L.N., Syn. Hep., 24; *Adelanthus decipiens*, Mitt. l.c.; *Odontoschisma decipiens*, Lindberg Mst. in Hartm. Skand. Fl. ii, 144 (1871); ejusd. in Not. Soc. F. Fl. Fenn., 362, (1874); G. et Rabenh. Hep. Eur. n. 474 (1871).

Hab. (var. *andina*) in sylva *Canelos* et monte *Tunguragua* Andium Quitensium, alt. 1200–2400 m., ad rupes et truncos prostratos in umbrosis (R.S., a. 1857).

Folia 2·5 *longa* (*ab ipsa insertione antica*), 2·0 *a basi postica* × 2·1 *lata*; *cell* $\frac{1}{24}$–$\frac{1}{20}$; *br. int.* 1·5; *per* 3–4 × 1·5; *br* ♂ ·5 × ·4 (× ·75 *explanatæ*); *br*^{la} ·25 × ·125, ·13 × ·13^{mm}.

Cæspites densi, luride virides, siccando fuscescentes, in vivo graveolentes. Caudices prostrati, intricato-ramosi, subtus radicellis villosi, fragiles, caules erectos ascendentesve fastigiatos edentes. Caules 1–1½-pollicares nigrescentes validi, simplices rarius furcati subramosive, e facie postica stolones paucos flagelliformes plus minus minutifolios plerumque radicelliferos proferentes, apice decurvuli.

Folia inferiora minora subimbricata appressa, superiora majora magis conferta, decurvo-secunda—raro distiche patula—oblique inserta, basi antica longe sensimque decurrentia, dein oblique orbiculata, apice rotundata retusave, margine antico incurva, postico subplana v. leviter concava et vel integerrima vel medio distanter 1–2–3-spinulosa, spinulis postice directis, cellulis intensius coloratis marginata, media basi indistincte vittata. Cellulæ subconformes, majusculæ, hexagonæ, intus subrotundæ ellipsoideæve, subpellucidæ fere vacuæ, limitibus validis trigonisque maximis flavidis, marginales subquadratæ valde

pachydermes, omnes sublævissimæ. Foliola caulina nulla v. rudimentaria.

Flores dioici : ♀ ramulo brevissimo postico e caulis basi—raro e medio caule inter folia—oriundo constantes. *Bracteæ* sub 9, trijugæ, tristichæ, extimæ minimæ squamæformes, intimæ foliis paulo breviores, *subrotundæ*, apice *plus minus profunde bifidæ laciniis patulis*, liberæ vel basi subconnatæ, subintegerrimæ. *Ramulus* ♀ apice pro pedicelli receptione profunde excavatus, cavitate pyriformi.

Perianthia foliis caulinis dimidio longiora, ex involucro alte emersa, anguste obovato-pyriformia turgida, superne obtuse 3-(raro 4–5-)gona, ore primum conniventi-clausa demum subtrifida, subdenticulata ciliolatave. Calyptra perianthio paulo minor, pyriformis, substantia firma cellularum stratis 3 conflata apice demum irregulariter trifida, inferne pistillidiis sterilibus sparse obsita. In unica calyptra numeravi 12 pistillidia abortiva, eidem prope basin præcipue adnata, quorum tamen duo ad dimidiam, unum ad $\frac{2}{3}$ calyptræ altitudinem posita fuerunt. Capsulas, in meis exemplaribus jam decisas, nondum vidi.

Amenta ♀ ramulos tenues albidos julaceos circinatos sistentia, caulis facie postica per totam longitudinem, sed præcipue basin versus, hic illic insidentia. Bracteæ 12-jugæ, v. pauciores, arcte imbricatæ, forma singulari subcymbiformes, vel potius cucullum reversum fingentes, valde concavæ et subsaccatæ vix tamen complicatæ, parum inæquilateræ, apice rotundato sæpius integræ raro bidentulæ, pellucidissime areolatæ, antheridium solitarium magnum brevi-pedicellatum foventes. Bracteolæ ubique obviæ bractearum dimidio numero, iisdem 2–4-plo breviores, subrotundæ oblongæve, integerrimæ v. angulatæ, haud raro folio proximo superiore basi connatæ.

Flagella, saltem in dimidio inferiore, folia rudimentaria minutissima tristicha distantia subquadrato-rotunda pellucida gerunt ; e cujusque folii basi externa profertur fasciculus parvus radicellarum tenuium fragilium ; folia versus flagelli apicem obsoleta nullave, radicellæ copiosiores, evadunt.

Caules validi : cellulæ 10-12 in diametro, corticales 30–36-seriatæ luridæ opacæ ; internæ vix angustiores subpellucidæ, in caule vetusto sæpe deficientes, cortice solo persistente !

Adelanthus decipens, Hook. (typicus), meipso ad *Kenmare Sound* Hiberniæ, lectus, humilior est quam Andinus. *Folia* minora, sæpius distiche patula, aliarum stirpium tamen decurvo-secunda ; alia ambitu subrhombea, acuta vel etiam acuminata apiculataque ; alia spinoso-bitri-lobulata ; omnia valde distincte marginata. *Cellulæ* subbasales cæteris paulo majores (neque tamen elongatæ—tales ac in cæteris *Adelanthis* videndæ, unde folia *vittata* fiunt).—In stirpe Andina, nunquam folia vidi nec acuminata nec profunde incisa lobulatave.—In Cubensi, ill. Gottsche delineata (in Rabenh. Hep. Eur., n. 474), perianthia matura spathæformia, hinc pro capsulæ emissione hiantia.

3. ADELANTHUS DECURVUS, Mitt. Mst.

Spruce in Journ. Bot. 1876.

Hab. in montibus *Guayrapurina* et *Campana* Andium Peruvianorum, alt. 800–1000 m., ad arbores vetustas, legit R. S. pl. ♂, a. 1855 ; insula Antillarum *Dominica* legit GUILDING, pl. ♂ et ♀ (hb. Wilson et Carrington).

Folia 1·2 × ·85, 1·0 × ·75, ·8 × ·65; *c* $\frac{1}{4\,5}$–$\frac{1}{4\,0}$; *bracteæ* ♀ 1·0 *longæ; per* 2·9 × 1·1, 1·3 × 0·9; *br* ♂ ·4 *longæ; br.æ.* ·25 × ·125; *anth* ·125mm.

Cæspites lati, ex albido flavicantes. Caudices prostrati, nigrescentes, tenues fragiles intricato-ramosi subaphylli, subtus radicelloso-tomentelli, caules ascendentes et flagella demissa proferentes. Caules 1–1½-pollicares, subrufi, simplices parcissimeve ramosi, ramique decurvi, siccando fere circinati, tenues vero validiusculi, basin versus —aliquando etiam apice attenuato—microphylli, ipsa basi subradicellosi, cæterum arhizi.

Folia dissitiuscula, accumbentia, fere, transverse inserta, basi antica brevissime decurrentia, madefacta lateraliter patentia plane succuba, siccando decurvo-secunda appressaque unde incuba viderentur, oblique ovato-rotunda (ramea subobovata), margine antico rectiusculo toto fere anguste incurva integerrimaque vel apicem versus 1–2-dentata, postico rotundato spinuloso-serrata-dentatave, dentibus 15–20 subinæqualibus divergentibus; nonnulla apice subbifida. Cellulæ parvulæ subæquilateræ pellucidæ, limitibus pallide flavidis validiusculis, ad angulos parum incrassatis, endochromio pallido, v. sparso v. in annulum congesto; marginales (anticæ præcipue) crassiores, transverse rectangulares; subbasales plurimæ mediæ cæteris duplo majores, subelongatæ, discolores, vittam fingentes.

Flores dioici: utriusque sexus e caudice, vel caulium basi nuda, orti, postici. Bracteæ ♀ sub 3-jugæ, tristichæ; intimæ (laterales) f. caulinis subæquimagnæ, suborbiculatæ, latiores quam longæ, apice varie lobatæ, lobis inciso-spinosis ciliatisve; bracteola tamen sæpe multo longior, anguste oblonga, superne parce spinuloso-denticulata apice ciliata.

Perianthia alte emersa ovato-fusiformia (subinde breviora et subrotunda) turgida, obtuse 3–5-carinata, ore constricto ciliata. Calyptra (juvenilis, et cum capsula adhuc concreta) incrassata, e cellularum stratis 4 conflata, pistillidiis sterilibus obsita.

Amenta ♂ tenuia albida incurva; bracteæ 3–8-jugæ, julaceo-imbricatæ tenerrimæ suborbiculatæ (multo latiores quam longæ) cochleato-concavæ, apice rotundato spinuloso-denticulatæ v. subintegerrimæ, margine antico toto in lobulum apice spinosum late incurvæ involutæve, singulæ antheridium solitarium magnum globosum, vel duo parvula, foventes. Bracteolæ ubique adjectæ, bracteis vix duplo breviores, cuneato-ligulatæ, apice breviter bifidæ, segmentis apiculato-acutis, subdenticulatæ.

XVIII. ANOMOCLADA Spruce, Journ. Bot. (May, 1876).

Plantæ lignicolæ, dense depresso-cæspitosæ, serpentino-reptantes, ramos foliosos floresque utriusque sexus e caulis facie antica media, radicelliferos (flagella) e postica, proferentes. *Folia* magna, succuba, basi obliqua inserta, assurgentia, apice decurva, subtus crispula, integra, celluloso-erosula; *cellulæ* mediocres pellucidæ incrassatæ. *Foliola* ubique præsentia parvula in mucum plus minus dissoluta. *Flores* dioici: ♀ ramulo brevi proprio antico constantes; *bracteæ* tristichæ, trijugæ, bifidæ, tres intimæ basi perianthio leviter adnatæ, duæ anticæ basi connatæ. *Pistillidia* circiter 20. *Perianthia*

magna anguste fusiformia trigona, ore subincisa. *Calyptra* parva tenuis. *Capsula* magna, valida, ab ipsa basi 4-valvis. *Elateres* elongati subattenuati bispiri decidui. *Sporæ* minutissimæ. *Flores masculi* amentulis anticis sistentes; *antheridia* solitaria.

ANOMOCLADA MUCOSA, Spruce, l.c. p. 134, tab. 178.

Hab. in sylvis fluviorum *Negro*, *Uaupés*, *Casiquiari* et *Atabapo* primævis, ad truncos prostratos putrescentes, sæpe aliis hepaticis muscisque irrepens.

Folia 1·5 × 1·3, 2·0 × 1·5; *cellulæ* $\frac{1}{50}$; *fta* ·25 longa; *brae int* 1·1 × 0·4, 1·6 × 0·5; *per* 4·0 × 0·5; *cal* 1·1 × 0·6; *styl* ·2; *caps* 1·1 × 0·5; *ped. sectio* ·35 × ·3; *elat* ·4; *sporæ* $\frac{1}{150}$ mm.

Cæspites lati depressi, albido-virides vel flavescentes, semper liquore mucoso suffusi. Caules 1–3-pollicares albidi tenaces, cellulis pluristratis opacis, corticalibus cæteris vix paulo latioribus, conflati; basi brevi spatio radicellis flagellisque rhizophoris repentes, foliis marcidis vestiti vel subnudi; dein a matrice liberi, arcuantes, densifolii, subtus radicelliferi nudive, statim devexi facieque postica flagella solitaria fasciculatave, valida, albida, subramosa, radicellis tenuissimis flexuosis villosa, demittentes; postea iterum assurgentes arcuantes radicantesque, apice plerumque liberi foliosi, raro attenuati subaphylli radicelliferi; facie antica ramos paucos assurgenti-arcuantes simplices vel ad caulis instar ramosos flagelliferosque proferentes. Flagella nodulis minutis conicis tristichis distantibus (foliis rudimentariis) basi externa radicelliferis obsita; noduli flagellorum apicem versus obsoletis, radicellæ copiosiores evadunt.

Folia valida nitida succuba, alterna vel per paria subapproximata, plus minus assurgentia, interdum secunda, undulato-convexa, apice decurvula, ad lineam obliquam angulum 30° cum caule efformantem lata basi inserta, late oblique ovato-ligulata, rotundato-truncata, sæpe retusa, raro subemarginata, medio margine utrinque recurva exindeque panduriformia, basi postica semicordata ibidemque sæpe tam gibba et crispato-sinuata ut caulis a postero visus cristatus videretur (ad *Plagiochilæ cristatæ* instar); cellulæ mediocres subconformes pellucidæ, pulchre guttulatæ, ovali-hexagonæ, pachydermes, ad angulos insigniter incrassatæ, intus 6-sinuatæ, endochromio parco in sicco sæpius in cellulæ ambituæ coacervato, extus perpaulo prominulæ, lævissimæ.

Foliola dissita foliis 6–8plo breviora, patentia, lata basi utrinque decurrente inserta, late ovata, in acumen subulamve brevem producta; inferiora plerumque tota fere in mucum soluta, itaque ad limbum angustum semilunatum redacta; superiora vix unquam perfecta, sed e margine apiceque plus minus dissolutis nunc irregulariter bifida, nunc quadrifida v. digitatim multifida, sæpius tamen eroso-lacera videnda. Radicellæ apice clavato-nodosæ, rarius subdivisæ, e foliolorum basi raro proferuntur.

Flores dioici: ♀ ramulo brevissimo caulis facie antica medium versus oriundo constantes. Bracteæ trjugæ, tristichæ, infimæ minutæ subbifidæ; supremæ foliis subæquilongæ, perianthii basi leviter adnatæ, a basi oblonga vaginante recurvo-squarrosæ, ad medium bifidæ, laciniis subacuminatis varie tortis angulatis subincisisve, duæ anteriores plus minus alte connatæ, tertia postica (bracteolave) paulo

angustior libera; bracteæ mediæ supremis sat minores minusque incisæ; omnes bracteæ pellucidæ elongate areolatæ.

Perianthia foliis fere 3-plo longiora, albida, pellucida, anguste trigono-fusiformia 8-plo longiora quam lata, superne obtuse triplicata, ore constricto breviter obsoleteve incisa, lævissima, demum infra medium compresso-teretia, cellulis subrectangularibus conflata. Calyptra perianthio fere 4-plo brevior, pyriformis, tenuis (e cellularum strato unico) basi ipsa pistillidiis sterilibus sub 20 circumdata, apice demum irregulariter bilabiatim rupta, labio altero stylo persistente rostellato. Capsula magna calyptræ æquilonga, nigra, cylindrico-oblonga, stratis cellularum duobus constans, demum ab ipsa basi 4-valvis, pedicello valido suffulta. Elateres badii, elongati, tenues, utrinque perpaulo attenuati, spira duplice prædíti, decidui. Sporæ minutissimæ læves nucleatæ.

Plantæ ♂ cum ♀ mixtæ, tenuiores, paucirameæ. Amenta antica, folio proximo breviora, tenuia, incurva albida. Bracteæ 8-jugæ, vel pauciores, foliis 4-plo breviores, tenerrimæ, suborbiculatæ, concavæ, lateribus incurvis, apice bilobæ, interdum 4-lobæ. Antheridia magna, solitaria, brevistipitata. Bracteolæ ovatæ apice bidentatæ, supremæ subrotundæ bracteis vix minores.

XIX. KANTIA Gray.

Nat. Arr. Brit. Pl. (1821). *Calypogeia* § B *Amphigastriatæ* Raddi (1820); *Calypogeia* Nees, Hep. Eur.; G. L. et N. Syn. Hep.

Plantæ majusculæ, depresso-cæspitosæ, pallide virides, olivaceæve, raro badiæ, in sicco sæpe fuscescentes, prostratæ vel apicibus (sæpe gemmiparis) assurgentes. *Caulis* sat validus, in planum simplex, raro furcatus, postice ramosus et radicellis prælongis, apice clavatis vel ramulosis, villosus. *Folia* majuscula imbricata incuba, alterna plana vel convexula, oblonga—interdum duplo longiora quam lata—sæpe subrhomboidea, integerrima, apice rotundata retusave, rarius acuta, bidentata vel biloba; *cellulæ* laxæ, majusculæ—rarius magnæ vel mediocres—æquilateræ vel oblongo-hexagonæ. *Foliola* ubique præsentia, foliis subduplo minora, subrotunda, raro reniformia, apice integra, retusa bifidave, margine integerrima, rarius denticulata spinulosave, vel utrinque unidentata-lobulatave; plerumque pellucida, sæpe tenerrima et quasi vitrea *Flores* hypogeni, in foliolorum axilla nidulantes, 1–3-ni, dioici vel monoici (interdum paroici), flore medio (in monoicis) persæpe ♀, flore utriusque lateris ♂. *Bracteæ* ♀ 2–3-jugæ, tristichæ, foliis multo minores, subrotundæ, ovales, lanceolatæve, integræ vel 2–4-fidæ, subconnatæ, demum in marsupii ore cum pistillidiis sterilibus persistentes. *Pistillidia* sub 12. *Marsupium* (in perianthii vicem) pendulum, subterraneum, clavatum vel subcylindricum, carnosum, pluristratum, radicellis hirtum, ore brac-

teis persistentibus squamosum, intus papillosum. *Calyptra* paulo brevior, marsupio ad apicem usque fere adnata. *Capsula* in pedicello valido (eodem diametro ac capsulæ) alte exserta, cylindracea, 3–4-plo longior quam lata, bistrata, cellulis strati interioris fibris semi annularibus fulcitis, ad basin usque 4-valvis ; valvulæ lineares, striis 3 vel 4 intensius coloratis percursæ, in spiram unicam completam contortæ, demum (sporis decisis) subexplanatæ. Elateres filiformes breviusculi subobtusi dispiri. Sporæ minutæ, eodem diametro ac elaterum, scaberulæ.—Pistillidia sterilia calyptræ apice insidentia.

Hab. In terra umbrosa humida, etiam ad truncos putrescentes, et in muscis repentes, rarius in rupibus.

Distr. In tota hemisphæra boreali proveniunt, majore copia autem sub æquatore in sylva calida Amazonica et in Andium radicibus orientalibus, ubi ipse 10 species, plerasque novas reperi.

§ 1. *Foliola apice rotundata obcordatave, vel ad summum levissime emarginata, apicibus rotundatis.*

1. *K. cyclostipa* S. Dioica prostrata, raro flagellifera. Folia rhombeo-oblonga truncato-rotundata-retusave, basi subsemicordata. Foliola = ½ folii, suborbiculata interdum obcordata.
2. *K. cæspitosa* S. Dioica cæspitoso-erecta, sat ramosa, eflagellifera. Folia majuscula rhomboidea rotundata subretusave, cellulis transversis angustis insigniter marginata. Foliola ovato-orbiculata integra vel breviuscule emarginata.
3. *K. nephrostipa* S. Dioica prostrata eflagellifera. Folia oblongo-ligulata retuso-truncata. Foliola 4plo breviora reniformia, apice subemarginata.

§ 2. *Foliola distincte bifida :*

a. rima apicali ad ⅓–⅔, in paucis ad folioli ½ usque.

4. *K. parallelogramma* S. Dioica elongata luride rufa dense intexta subflagellifera. Folia oblique ligulata, fere parallelogramma, truncata sæpe retusa, cellulis mediocribus æquilateris, trigonis ad angulos auctis, cuticula insigniter tuberculosa. Foliola plus duplo minora tenuissima, late ovata breviter bifida, segmentis cuspidatis subspinulosis.
5. *K. mastigophora* S. Dioica pallide viridis sat ramosa et flagellifera. Folia falcato-oblonga subtruncata, basi antica subsemicordata ; cellulæ mediocres suboblongæ, marginales minores caducæ. Foliola 5plo minora, tenuia, reniformi-rotunda, interdum subdenticulata, breviter bifida, segmentis subacutis obtusisve.
6. *K. rhombifolia* S. Dioica pallide viridis flaccida laxe stratificata. Folia late rhomboidea plus minus acuta, rarissime bidentella, erosula, cellulis majusculis plerisque oblongis. Foliola 4plo minora cuneato-quadrata, ad ½ bifida, segmentis obtusatis.
7. *K. biapiculata* S. Dioica olivaceo-viridis tenuis. Folia oblique ovata subdecurrentia repanda, apice angusto emarginato-biapiculata, cellulis majusculis æquilateris marginalibus minoribus. Foliola 3plo minora,

late orbiculata, ad ½ bifida, segmentis bifidulis, margine utrinque 1–2-denticulata.

b. rima apicali ad ⅔–¾ vel ad folioli basin usque fere protracta.

8. *K. leptoloma* S. Paroica pallide viridis tenuis. Folia parvula rhombeo-oblonga subdecurrentia, celluloso-dentata, apice angusto biapiculata; cellulis majusculis, marginalibus linearibus (caulis axi subparallelis) falcatis. Foliola 4plo breviora, profunde bifida, lobis bifidulis raro integris. Marsupia foliis subæquilonga villosa, pariete 6–8-strato.
9. *K. amazonica* S. Autoica albido-viridis sat robusta. Folia magna ovalia, subduplo longiora quam lata, emarginato-bidentata, dentibus acutis, rarius integra; cellulis magnis oblongo-hexagonis. Foliola foliis 8plo breviora bifida, lobis divergentibus bifidulis. Marsupia foliis sat longiora cylindrico-conica villosula, pariete 2–3-strato.
10. *K. tenax* S. Dioica pallide olivacea elata, radicellis validis repens. Folia magna ligulato-oblonga rotundata retusave, cellulis magnis longe hexagonis. Foliola foliis 5–7plo breviora, oblata, ad basin fere usque bipartita, lobis ovatis obtusis rotundatisve, raro acutis.

1. KANTIA CYCLOSTIPA, Spruce.

Hab. Andes Peruvianos, alt. 1000^{m}, in terra umbrosa humida montis *Campana*.

F. 8 × ·65, ·8 × ·5, *c* $\frac{1}{24}$–$\frac{1}{20}$; *f*^{la} ·4 × ·45; *br* ·5 × ·3^{mm}.

Rufo-badia prostrata. Caules pollicares parum ramosi æquifoliati, ramis raro subflagellaribus.

Folia parum imbricata, subplana, rhomboideo-oblonga, basi antica subsemicordata, apice truncato-rotundata-retusave, raro emarginata; cellulæ majusculæ subplanæ æquilatero-hexagonæ vel suboblongæ, marginales minores quadratæ, omnes facie crebre tuberculosæ, ad angulos incrassatæ.

Foliola contigua ½ folium æquantia, ovato-orbiculata, apice rotundata vel subemarginata, plana pellucida, cellulis tenuibus elongatis, marginalibus ad angulos externos prominulis.

Flores dioici: ♀ solitarii (imperfecti). Bracteæ ½ folium excedentes, oblongæ concavæ bifidulæ, aliis subulatis immixtis.

Androecia solitaria, spiculam posticam incurvam sistentia; bracteæ 6-jugæ, latiores quam longæ, complicato-concavæ, eroso-subbifidæ; bracteolæ foliolis subconformes angulato-denticulatæ.

Var. *celluloso-serrata*, minor, fulva vel fuscidula, caule parum ramoso, radicellis validis folia 2–3-plo excedentibus repente. Folia minora (·5 × ·35^{mm}) typicis conformia; cellulæ minores ($\frac{1}{30}^{mm}$), asperulæ, marginales plus minus conico-prominulæ (unde folia serrulata evadunt). Foliola plus duplo minora (.2^{mm}) orbiculata, apice brevissime obtuse bidentella vel integra nisi pro cellula hic illic in dentem prominula.—Forsan eadem ac *Jung. cellulosa* Spreng.

No valid character separates this variety from the type, and some approach to the marginal cells projecting as teeth is seen occasionally in other species of *Kantia*. Whether it be the *Jung. cellulosa* Spreng. Syst. Veg. (=*Mastigobryum cellulosum* Ldng. Syn. Hep. 217, and Spec. Hep. t. 3) I am unable to say. It is certainly very like the figure just quoted, but in the description the leaves are called "*obovato*-trapezoid," which I

have never seen in the Andine plant. If it should prove to be the same, and to be not distinct from *K. cyclostipa*, then that name must give place to the prior *K. cellulosa* (Spreng.).

2. KANTIA CÆSPITOSA, Spruce.

Hab. In sylva *Canelos* Andium Quitensium, alt. 1000^{m}, ad arborum radices lignaque.

F 1·5×·75 ; *f*^{la} ·6×·6, ·65×·7 ; *c* $\frac{1}{20}$—$\frac{1}{16}$; *br* ·5^{mm}.

Cæspites lati olivaceo-virides, intus flavescentes ; caules erecti fastigiatim ramosi—interdum ad speciem dichotomi, ramis autem omnibus hypogenis, parce radicellosis.

Folia incuba majuscula, contigua vel subimbricata, plana sat valida, rhomboidea—duplo longiora quam lata—apice rotundata subretusave, basi postica longiuscule decurrentia, toto ambitu marginata ; cellulæ majusculæ oblongo-hexagonæ leptodermes chlorophyllosæ, marginales uniseriatæ multo angustiores transversales subincrassatæ pellucidæ.

Foliola foliis plus duplo minora, dissita, ovato-orbiculata integra vel apice brevissime angusteque emarginata, cellulis pellucidis vacuis subrectangularibus, marginem versus flexuosis, areolata.

Flores dioici : ♀ hypogeni ; bracteæ foliolis fere conformes, subminores, valde concavæ, apice integræ vel leniter fissæ.

Obs. Grows around the base of trees and extends for a foot or two up the trunk in a continuous tufted olive-green mat. This habit gives it an aspect distinct from that of every other *Kantia*, and assimilates it, at first sight, to *Lejeunea*. The East Indian *K. alternifolia* (Nees) S.—figured in 'Species Hepaticarum' t. 2 as a *Mastigobryum*—must be a very near ally.

3. KANTIA NEPHROSTIPA, Spruce.

Hab. Ad truncos putridos, etiam ad terram in rivulorum ripis, in sylvis fl. *Negro* Venezuelæ, locis *San Carlos*, *Javita*, &c.

F 1·2×·7 ; *c* $\frac{1}{20}$—$\frac{1}{16}$; *f*^{la} ·3×·45 ; *br* ♀ ·5×.25, ·5×·4^{mm}.

Prostrata, e pallide viridi badia rufescensve. Caules 1–2-pollicares vage subramosi implexi arcte repentes.

Folia per paria approximata, superiora subopposita, subplana, angulo fere recto divergentia, basi ad $\frac{1}{3}$ lat. imbricata, suboblique oblongo-ovatove-ligulata, basi subdecurrentia, apice lato retuso-truncata, (angulis rotundatis), margine repanda vel celluloso-crenulata ; cellulæ majusculæ oblongæ leptodermes, ex endochromio parco annulari pellucidæ, marginales minores.

Foliola foliis 4-plo breviora, dissita, plana, reniformia, apice acute emarginata obcordatave, angulis rotundatis, e basi radicellas plurimas longas albidas flexuosas subdivergentes edentia.

Flores dioici : ♀ solitarii binive. Bracteæ suberectæ 3-stichæ 3-jugæ, angulatæ denticulatæve, inæqualiter breviterque bifidæ, angustæ, forma variæ. Marsupia. . . .

Amenta ♂ folio proximo sublongiora incurva ; bracteæ 10-jugæ secundæ ovato-rotundæ concavæ breviter bifidæ ; bracteolæ minores subquadratæ emarginatæ.

4. KANTIA PARALLELOGRAMMA, Spruce.

Hab. Ad fl. *Uaupés* prope *Panuré*, in declivibus umbrosis humidis ad terram, rupes, truncosque semiputridos.

F 1·1 × ·6 ; *c* $\frac{1}{30}$—$\frac{1}{25}$; *f*^{ta} ·45 × ·4, ·5 × ·35^{mm}.

In plagas latas prostrata, e rufo olivacea nigrescensve. Caules 3-pollicares dense intexti flexuosi parum ramosi, ramis assurgentibus elongatis sæpe fere arhizis, nonnullis (rarissimis tamen) descendentibus flagelliformibus radicellosis et subaphyllis.

Folia parum imbricata contiguave, decurvula v. subplana, oblique ligulato-oblonga fere parallelogramma, truncato-rotundata retusave, plus minus repanda ; cellulæ æquilateræ mediocres, facie interna rotundæ annuloque angusto opaco cinctæ, ad angulos trigonis auctæ, cuticula crebre et regulariter tuberculoso-asperula.

Foliola plus duplo minora ovato-rotunda v. ovato-oblonga, angulato-denticulata, breviter (ad $\frac{1}{5}$—$\frac{1}{3}$) bifida, segmentis erectis v. sæpius conniventibus cuspidato-acuminulatis, subspinulosis, tenuissima fragilia (vitrea) elongato-cellulosa.

Fl. dioici : ♂ spiculæ minutæ amentiformes e folioli axilla ortæ : bracteæ minutæ arcte imbricatæ obcordato-orbiculatæ concavæ monandræ. Bracteolæ adjiciuntur.

Obs. Cellulæ caulis 8 in diametro, 20 in ambitu, corticales scilicet rectangulares ·06–·08^{mm} longæ, duplo triplove longiores quam latæ ; interiores eodem fere diametro multo longiores, pariete opaculo (tuberculoso ?)

5. KANTIA MASTIGOPHORA, Spruce.

Hab. in trunco putrescente ad rivulum *Cauapuna*, juxta *San Caros del Rio Negro.*

F 1·2 × ·8 ; *c* $\frac{1}{30}$; *f*^{ta} ·25 × ·4 ; *br* ·5^{mm}.

Pallide viridis prostrata. Caules 1½-pollicares, in genere sat ramosi, ramique subæquifoliati, radicellis repentes et intricati ; alii rami autem (neque pauci) flagellares subaphylli radicantes.

Folia paulo imbricata subplana, axi angulum 70°–90° cum caule efficiente, patentia, subfalcato-oblonga, rotundata, obtuse truncata, vel retusula, repanda et celluloso-crenulata, basi postica decurrentia, antica rotundata vel semicordata ; cellulæ mediocres subpellucidæ oblongæ vel subæquilateræ, pariete ad angulos incrassato, marginales minores fragiles sæpeque deciduæ.

Foliola 5-plo minora reniformi-rotunda, vix ad ¼ usque bifida, segmentis subacutis obtusisve, tenuia fragilia repanda, interdum subdenticulata.

Flores dioici : ♀ postici, solitarii binative. Bracteæ bijugæ erecto-incurvæ, foliis plus duplo breviores, ovales lanceolatæve bifidæ, segmentis subacuminatis, grosse subserratæ, liberæ vel sæpius basi vario mode connatæ. Fl. ♂ haud visi.

K. parallelogramma S., caule flagellifero similis, differt colore lurido ; ramis assurgentibus ; foliolis multo majoribus angustioribus bicuspidatis subspinulosis.

6. KANTIA RHOMBIFOLIA, n. sp.

Hab. In terra umbrosa ad fl. *Bombonasa* ripas.

F ·8 × ·65, *c. inf.* $\frac{1}{20}$, *f*^{la} ·2 × ·15^{mm}.

Pallide viridis, dein fuscidula, in plagas latas laxas prostrata; caules 2-pollicares flaccidi parum ramosi.

Folia contigua v. parum imbricatula, incuba, subplana, late patentia, late rhomboidea, angulo externo (inferiore) rotundata, apice acuta, apiculata, subobtusave, rarissime bidentella, margine e cellularum suturis subprominulis erosula (sed non limbata); cellulæ majusculæ leptodermes subpellucidæ, subelongatæ, paucæ subapicales sat minores æquilateræ. In aliis plantis adveniunt hic illic per caulem folia pauca consecutiva cæteris minora, magis dissita, oblique triangularia.

Foliola 4plo minora, caule haud latiora, subquadrata vel cuneato-quadrata, ad medium bifida, segmentis obtusatis subinæquilongis.

Foliis immarginatis sæpissime integris, foliolis solum ad medium usque bifidis, segmentis integris nec bifidulis, a *K. leptoloma* satis differt.

7. KANTIA BIAPICULATA, Spruce.

Hab. Andes Peruvianos in monte *Campana*, sociis *Odontoschismate denudato*, *Lophocolea muricata*, &c.

F 1·1 × ·85; *c* $\frac{1}{24}$–$\frac{1}{20}$; *f*^{la} ·35 × ·4^{mm}.

Prostrata tenuis e viridi olivacea; caules pollicares arcte repentes vage ramosi.

Folia subimbricata decurvo-convexa oblique ovata parum decurrentia repanda, apice angusto emarginato-biapiculata, sinu lunulari acutove; cellulæ majusculæ subæquilateræ valde leptodermes pellucidæ, fere vacuæ, marginales minores.

Foliola triplo minora dissita, late orbiculata, basi valde radicellifera, ad medium bifida, sinu prælato triangulari lunulatove, segmentis subacutis vel bifidulis, extus grosse 1–2-denticulatis.

Flores dioici: ♀ hypogeni, (juveniles, imperfecti). Bracteæ suborbiculatæ concavæ apice inæqualiter quadrifidæ.

K. amazonica S. folia habet multo longiora, apicibus solum acutis, cellulis oblongis subduplo longioribus quam latis; foliola multo minora profunde bifida, &c.—*K. peruviana* (Nees) differt caule flagellifero; foliis apice sæpe integris; foliolis parvis profunde bifidis, margine integerrimis.—*K. leptoloma* S. florescentia paroica; foliis subrhombeis, e cellulis longis insigniter marginatis; foliolis minoribus profunde fissis; distinctissima est.—*K. arguta* Mont., nostræ sat similis, cellulas habet duplo fere majores; foliola bipartita, segmentis in lacinias duas subulato-acuminatas fissis.

8. KANTIA LEPTOLOMA, Spruce.

Hab. in trunco carioso ad *Panuré* fluvii *Uaupés*.

F ·85 × ·65; *c* $\frac{1}{16}$–$\frac{1}{20}$ × $\frac{1}{24}$, *marginales* $\frac{1}{10}$; *f*^{la} ·2 × ·2; *br* ·35 × ·3; *marsupium* ·85 × ·5^{mm}.

Pallide viridis tenuis prostrata, in matteolas laxas intexta, radicellis raris. Caules 1–2-pollicares teneri parum ramosi; rami postici, alii normaliter foliosi, alii parvifolii subflagelliformes raro apice radicantes.

Folia incuba subplana, perpaulo imbricata, ad lineam fere longitudinalem, angulo postico subdecurrentem, inserta, rhombeo-oblonga-ovaliave, apice angustato acute biapiculata, sinu rotundato; apiculis brevi-

subulatis, 2–4-cellulas altis, acutis; toto margine e cellularum angulis extimis prominulis ad speciem dentata: cellulæ majusculæ leptodermes, intus annulo pertenui opaco cinctæ, superiores æquilateræ, mediæ inferioresque submajores oblongæ, marginales elongatæ lineares falcatæ (extus concavæ) flaventes, folii limbum sistentes.

Foliola distantia, foliis 4plo breviora, subrotunda, profunde (ad $\frac{2}{3}$–$\frac{3}{4}$) bifida, segmentis bifidulis bidentulisve, raro integris et acutis.

Flores paroici, e foliolorum posticorum axillis orti, fasciculati, 1–4ni, sæpius 3ni. Bracteæ 3–4-jugæ, foliis duplo minores, ovato-orbiculatæ, concavæ, ad $\frac{1}{2}$ fere usque 3–4-fidæ, segmentis inæqualibus acutis, tenerrimæ, laxe elongate areolatæ; bracteolæ breviores subulatæ, interiores sublatiores utrinque unidentatæ, vel subtrifidæ, raro plurifidæ. Ad bractearum axillas adstant antheridia solitaria majuscula globosa pedicellata; ad torum terminalem pistillidia 10–12, vel pauciora, antheridio uno alterove subinde adjecto.

Marsupia foliis æquilonga, oblonga vel subpyriformia, extus radicellis longis fuscidulis villosa, stratis cellularum 6–8 conflata, ore obliquo bracteis congestis stipata: juvenilia solum visa, quibus neque calyptra nec capsula aderat.

Obs. Cellulæ folii marginales *longitudinales*, nec transversæ quales in *C. laxa* G. et L., *C. cæspitosa* Spruce, aliisque speciebus inveniuntur.

9. KANTIA AMAZONICA, Spruce.

Hab. in umbrosis ad terram, locis *Tauaú* prope fl. Amazonum ostia, *Manãos* et *S. Gabriel* fl. *Negro*; annis 1849–1852 legi.

F 1·5 × ·9, 1·5 × ·6, f^{la} ·2 × ·35; *c* $\frac{1}{12} \times \frac{1}{25}$, $\frac{1}{15} \times \frac{1}{25}$; *br* ·25–·5 *longæ; marsup* 2·4 × ·55; *caps* 1·2 × ·4^{mm}.

Albido-viridis, tenui strato late effusa. Caules pollicares arcte repentes flexuosi vage ramosi.

Folia subimbricata, angulo lato patula, apice decurvula, subobliquе ovalia oblongave—subduplo longiora quam lata—apice rarissime integra plerumque emarginato-bidentata, sinu brevi acuto obtusove, dentibus acutis; cellulæ magnæ oblongo-hexagonæ leptodermes pellucidæ, endochromio parcissimo.

Foliola parva, foliis 8plo fere breviora, caule vix latiora, distantia, valde oblata, profunde bifida, segmentis divergentibus angustis bifidulis subacutis.

Flores monoici, 1–3ni (laterales masc., medii fœminei). Fl. fœm. bracteæ foliis 3–6plo minores profunde 2–3-fidæ, segmentis inæqualibus subulatis incurvo-uncinatis. Pistillidia plura perbrevia.

Marsupia pendula, foliis dimidio longiora, cylindrico-conoidea, curvula, radicellis longis villosula, stratis cellularum 2 v. 3 conflata; ore hinc cauli processu brevi adfixa, et bracteis et pistillidiis abortivis circumdata. Calyptra (=$\frac{1}{2}$ marsup.) alte exserta cylindrico-oblonga, 4-valvis; valvulæ in spiram unicam completam convolutæ, lineares tristriatæ, demum explanatæ substrictæ, basi in discum caviusculum, cellulis 4 magnis rhombeis, paucis minoribus subtrigonis circumdatis, conantem oblique coalitæ.

Amenta mascula fl. fœmineo sæpe collateralia, albida brevia; bracteæ 3-5-jugæ minutæ profunde bifidæ, segmentis acuminatis, sæpe b si hinc vel utrinque spina auctæ, monandræ. Accedunt bracteolæ.

Var. *inæquifoliata*. Albicans pellucida, caule inæquifoliato, nempe foliis altero caulis latere deficientibus vel ad squamulas bidentulas redactis. Folia ovato-ligulata exciso-bidentula. Foliola sæpe dimidiata, dimidio altero (folio rudimentario subjecto) obsoleto, vel ad processulum subulatum redacto.—*Hab.* in terra umbrosa fluvii *Uaupés*. Folia, semper sat longa, in aliis exemplis subobovata, in aliis rectangularia fere videntur. In omnibus folia hic illic minora, diversiformia, vel altero caulis latere fere deficientia, altera magna, inveniuntur. *C. Miquelii* Mont., e descriptione cl. auctoris huic affinis erit; quandoquidem folia "rotundato-bidentata," et foliola solum "bifida" (nec bis bifida) dicta sunt, pro diversa specie habituram censeo. K. *Sprengelii* Mart. certe differt foliis tam latis fere quam longis (nec subduplo longioribus, ac in nostra), cellulis subduplo brevioribus; foliolis multo majoribus; bracteis 3 ad $\frac{1}{3}$ solum fissis, &c.

10. KANTIA TENAX, Spruce.

Hab. In truncis prostratis putresc. in sylvis fl. *Negro* et *Uaupés*, locis *Umirisál* prope *Manáos*, *Panuré*, &c.

F 2·0 × 1·0, 1·5 × ·9; *c* $\frac{1}{13}$–$\frac{1}{10}$; f^{la} ·3^{mm} *longa*, *lobi* ·25^{mm} *lati*.

Elata pallide olivacea prostrata, matteolas latas tenaces efformans. Caules 2–4-poll. vage divaricato-ramosi, radicellis validis repentes.

Folia patula subplana vix decurvula, sæpe per paria approximata, perpaulo imbricata, ex insertione fere longitudinali oblique ligulato-oblonga v. subrhomboidea, apice lato rotundata retusave; cellulæ magnæ elongato-hexagonæ leptodermes pellucidæ subchlorophyllosæ. Folia superiora sensim multo minora, unde rami sæpe lanceolati videntur.

Foliola dissita foliis 5–7-plo breviora, oblata ad basin fere usque bipartita, lobis divergentibus sæpe recurvis ovatis ovalibusve acutis v. obtusis.

Fl. dioici: ♀ postici sæpe fasciculati; bracteæ foliis plus duplo breviores erecto-patulæ ovato-oblongæ; bracteolæ breviter bifidæ.

K. amazonica subminor est, albicans, tenerior, ramis haud divaricatis; foliis minoribus ovalibus emarginato-bidentatis; foliolis subminoribus bis bifidis.

Subtribus V. *SCAPANIOIDEÆ*.

Caules e rhizomate repente aphyllo radicelloso orti, arcuati erective, pauciramei, ramis omnibus lateralibus, e folii axilla oriundis, nisi perraro adveniat innovatio una alterave sub-floralis e caulis facie postica orta. *Radicellæ* caulinæ sæpe crebræ, semper fere coloratæ, rubræ purpureæve, raro pallidæ. *Folia* alterna transversa, distiche explanata vel decurvula, sæpe maxima, complicato-biloba, amplexicaulia et ubi confertiora equitantia, utroque angulo basali carinâque brevissime decurrentia; lobi inæquales, anticus (i.e. lobulus) minor, rarissime postico subæquimagnus; carinâ plicâve semper fere acutâ, haud raro alatâ; margine in omnibus fere pulchre denticulato, spinuloso ciliatove, interdum primum pinnatifido dein dentato; facie supera in plerisque nuda, in aliis autem lamellata pilosave; *cellulæ* magnitudine variæ, cuticula scabra vel lævissima. *Foliola*

in plurimis omnino nulla; in aliis *Schistocheilis* autem adveniunt sat magna, biloba, margine vario modo incisa. *Flores* terminales dioici, raro paroici. *Androecia* spicata; bracteæ di-polyandræ. *Gynœcia* sæpe innovatione suffulta; *bracteæ* foliis subconformes, erectiores tamen, magis æquilobæ; in *Schistocheila* autem 3 vel 4 pares, cum suis bracteolis, caulis apici turgido et cavo (perianthii vicibus fungente) adnatæ, summi verticilli interdum in cyathum 6—9-fidum connatæ. *Pistillidia* sat numerosa. *Perianthium*, ubi adest, emersum, a fronte compressum, aut subinflatum et 5-pluricarinatum. *Calyptra* ovalis pyriformisve, aut libera, tenuis basique pistillidiis sterilibus cincta; aut (in *Schistocheila*) adnata, apice pistillidia gerens. *Capsula* in pedicello sat alto, vel breviusculo, exserta, oblonga, interdum plus duplo longior quam lata, pluristrata, ad basin 4-valvis. *Elateres* dispiri capsulæ parieti interno undique affixi. *Sporæ* parvulæ.

Of this subtribe I gathered only a single species in equatorial America, of the same genus (*Scapania*) which in our northern clime is more abundant than any other, flourishing in rocky wooded dells and indeed wherever there is the requisite moisture and shade. The species are mostly conspicuous from their size, tufted growth, beautifully toothed large leaves, and often for their colour, nearly every species having a roseate or purple variety; but none of them equals in size the *Scapania* I gathered in the savage Forest of Canelos, on the eastern slope of the Andes, nor does any European species grow normally, as it does, on the trunks of living trees, although all luxuriate on fallen and decaying timber.

Schistocheila Dum. (=*Gottschea* Nees), the southern analogue of *Scapania*, and still more remarkable for its large and beautiful foliage, is entirely absent from equatorial America, although a few species occur in the eastern tropics. In S. America it does not begin to appear until we reach Patagonia and the southern parts of Chili, but its great home is in Australasia. To the same subtribe belong *Schistocalyx* Lindberg (=*Jung. densifolia* Hook., *J. vertebralis* Tayl., &c.) whose fructification is unknown to me; and *Diplophyllum* Dum., of which we have 3 British species, *D. Dicksoni* (Hook.), *D. obtusifolium* (Hook.) and *D. albicans* (L.), the last-named probably the commonest of all European hepaticæ, growing as it does at all elevations and in almost every possible variety of site.*

* That *D. Dicksoni* is a true *Diplophyllum* I cannot doubt. It has all the characters of the genus, and the pluriplicate perianth, the axillary branches, &c., are quite conformable to those of *D. albicans*. An allied species, *D. argenteum* (Tayl. hb.) from N. W. America, is an equally decided congener. I add a brief character. *D. argenteum* (Tayl. !) Spruce. Folia transversa, superiora equitantia, ad ¾ complicato-biloba, lobis lanceolatis acuminatis, antico postico subæquilongo sæpius duplo angustiore, margine grosse serrata, basi crenulata. Br. 3-jugæ, confertissimæ, intimæ suborbiculatæ ad ½ 2–4-lobæ, lacinulato-spinulosæ. Per. emersum ovali-fusiforme, ab ipsa basi obtuse 12-plicatum, ore in cilia numerosissima flexuosa intexta fissum, quasi-tomentosum.

Diplophyllum brings us into immediate contact with Lindberg's § *Sphenolobus* of *Jungermania* (=*J. minuta*, *J. saxicola*, &c.), which, indeed, form

XX. SCAPANIA, Dum.

Recueil, (1835); *Radula* § 2 *Scapania* Dum. Syll. (1831).

Genus unicum hujus subtribus meipso sub Æquatore lectum a cæteris generibus perianthio donatis distat perianthio compresso-plano, faciebus normaliter eplicatis, carinis aciebusve lateralibus ad anthophyllorum plicam, suturis anticâ et posticâ haud perceptibilibus, vel posticâ in carinam humillimam elevatâ; nullibi alata, ore lato truncato integerrimo, dentato, vel lobulato. Bracteæ ♂ 3—12-andræ (usque ad 20-andræ, *Syn. Hep.*)—De habitatione speciei Andinæ solitariæ videas infra.

1. SCAPANIA SPLENDIDA, Spruce.

Hab. Andes Quitenses, in montis *Abitagua* cacumine pluvioso, alt. 2000^{m}, ubi ad palmarum truncos viget.

F. lob 5·5 × 3·3, *lobul* 4·2 × 3·3, 3·0 × 2·5; *carina* ·8 – 1·0; *c* $\frac{1}{40} - \frac{1}{30}$; *per* 8·0 × 3·7; *cal* 3·0 × 2·0; *caps* 2·75 × 1·25; *sectio caulis* ·8 × ·5^{mm}.

Cæspites elati laxiusculi penduli. Caules 3-pollicares, ramos paucos axillares cauli subparallelos, edentes, fere arhizi, nigrescentes, validi, subcompressi, sectione ovali, strato corticali proprio nullo, cellulis exteriòribus minoribus coloratis (opacis), interioribus subpellucidis, omnibus parvis sectione fere æquilateris.

Folia maxima albido-viridia basi purpurascentia parum imbricata fere horizontaliter patula subplana bipartita; lobus suboblique ovalis rotundatus raro solum obtusatus basi postica crispulus caulem late transiens, toto margine minute crebre spinuloso-denticulatus; lobulus subdimidio brevior, fere æquilatus, late rhomboideo-ovalis, obtusus v. abrupte acutus, subconcavus, margine spinuloso lobo appressus, basi antica dilatata subcrispula caulem late transiens. Cellulæ inferiores elongatæ, superiores submarginalesque fere æquilateræ, parvulæ incrassatæ, minute 6-sinuatæ, cavitate ovali plus minus elongatâ subinde angulatâ, subopacæ sublævissimæ.—Insertio tam lobi quam lobuli est fere tranversalis, ad lineam arcuatam utrinque in caule subdecurrentem. Lobi a basi ad $\frac{1}{7} - \frac{1}{5}$ altit. connati, suturâ convexa (arcuatâ) fere horizontali vix alatâ.

Flores dioici: ♀ terminales; bracteæ (sc. folia suprema) cæteris foliis parum diversæ, minus patentes, basi perianthium arcte amplectentes, lobis paulo inæquilongis altius (fere ad $\frac{1}{2}$) connatis, carinâ angulum cum caule acutum formante. Folia bracteis proxima in typum normalem sensim transeuntia.

Perianthia alte emersa, bracteis vix duplo longiora, pallida, basi purpur-

part of *Diplophyllum* as originally proposed by Dumortier. In this, as in many other cases, it is a merely artificial line which we are obliged to draw between two adjacent groups. The relationship of *Scapania* to *Plagiochila* seems to me by no means so close as it has been represented; the distinctly succubous leaves of the latter, the entire absence of an antical lobule, the laterally (not frontally) compressed perianth, and other differences sufficing to separate them somewhat widely, notwithstanding the sharply-toothed leaves usual to both genera.

ascentia, compresso-tubæformia, ore complanato suboblique truncato pluri-(sub 15-) lobulata, lobulis inæqualiter spinulosis. Calyptra brevis pyriformis, basi pistillidiis pluribus obsita. Capsula badia calyptra vix brevior ovali-cylindrica, in pedicello perianthium haud duplo superantem suffulta, 4-valvis.

Subtribus VI. EPIGONIANTHEÆ.

Plantæ mediocres elatæve, rarius pusillæ vel minutæ. *Caules* vel e caudice repente microphyllo radicelloso assurgentes erective, sæpe robusti et normaliter arhizi, vel ab initio procumbentes prostrative radicellosi et foliosi; *ramificatio* sæpe vaga, haud raro dichotoma, rarissime pinnata; *rami* in omnibus fere plus minus exacte laterales, e foliorum axilla juxta angulum posticum—raro e media axilla—oriundi; in perpaucis postici, foliolis axillares. *Folia succuba,* raro (ubi confertiora) subtransversa, nunquam incuba, in plerisque alterna, in plerisque aliis opposita (raro utrinque cum contrariis connata, persæpe autem postice cum foliolo intermedio in verticillum trifoliatum connata); ambitu orbiculata, ovata ovaliave, interdum subquadrata, nunquam filiformia, frequenter autem subdimidiata; in aliis integra, in aliis bifida, in aliis paucis 3–5-fida. *Cellulæ* ut-plurimum mediocres majusculæve, vix unquam minutæ; æquilateræ vel oblongæ. *Foliola* raro sat magna et ubique præsentia; plerumque vel nulla vel parva et squamulæformia. *Flores* acrogeni, in solum paucissimis cladogeni; in robustioribus constanter fere dioici, in tenellis et pusillis sæpe monoici. *Bracteæ* ♀ 1–5-jugæ, foliis subconformes vel magis incisæ, subinde basi subconnatæ, vix unquam in cyathum coalitæ; in *Nardia* autem et affinibus perianthio plus minus alte adnatæ; in generibus marsupiocarpeis quandoque minutæ, inter se in coronulam duplicem triplicemve marsupii os cingentem connatæ. *Perianthium* (ubi adest) a latere plus minus compressum;* in aliis a basi vel saltem supra medium complanatum, ore lato truncato vel bilabiato, sæpe dentato ciliatove, aciebus (antica et postica) subinde alatis; in aliis trigonum (angulo tertio in fronte, i.e. antico), ore hiante 3–6-lobum, angulis alatis vel nudis; in aliis turgidiusculum, 3–10-plicatum-carinatumve (rarissime teres atque cylindricum) apice constrictum microstomum vel primum clausum demum valvatim ruptum. *Calyptra* plerumque tenuis, rarius carnosula, in plerisque libera basique pistillidiis sterilibus circumdata; in paucis perianthio vel involucro adnata, apice solo pistillidia sterilia gerens.

* Nisi in genere *Marsupella* ac in *Jungermaniæ* paucis speciebus, perianthio a fronte compressulo vel impresso donatis.

Capsula in pedicello brevi vel sæpius sat longo suffulta, raro sphærica, sæpius oblonga vel subcylindrica, valida, 2–8-strata, ad basin usque 4-valvis. *Elateres* dispiri, paucis ex parte vel tota longitudine monospiris raro adjectis. Sporæ parvulæ—minutæ. *Andrœcia* spicata, raro hypogyna, rarissime ad ramulum proprium relegata, plerumque in caulis ramive medio apiceve posita; bracteæ foliis consecutivæ, pro more minores, 1–10-andræ.

In the subtribe *Trigonantheæ* the leading character was to have the perianth flattened from the front, and its primary angles at the axis, or fold, of the three complicate flower-leaves; hence its trigonous form, with a flat front, an angle on each side, and a third angle at back. But in the subtribe *Epigonantheæ* the primary angles are at the marginal sutures of the flower-leaves, and not at their axis; so that where there are only two such leaves, and they are pressed together by their faces, a complanate perianth results, at right angles to the normal plane of the leaves, with one of its edges antical, the other postical, as in the large genus *Plagiochila*. Where an underleaf exists and the flower-leaves are three, the perianth may be trigonous, with the third angle in front, as we see it in *Lophocolea;* or it may still be complanate and ancipitous, if the underleaf be folded along the middle, so as to present only one edge at back, instead of two, of which we have an example in *Leioscyphus*.

In all these genera the perianth is as wide at the mouth as in the middle, or even wider; but in some genera, of which *Jungermania* proper is one, it is constricted—or even before the protrusion of the capsule quite closed—at the apex; never complanate, and rarely only trigonous; usually more or less inflated, and traversed by from 3 to 10 angles, or folds. In a few species, mainly of the subgenus *Lophozia*, the perianth is terete—or tereti-polygonal—so that it is impossible to say whether the compression is lateral or frontal, except in the very early stage, where it is mostly discernible.* In *Marsupella*, however, the compression is decidedly frontal; yet the genus is so closely related to *Nardia* (where the compression of the perianth is lateral) that, in a natural arrangement, it must perforce stand next to it, for Nature is continually overstepping our artificial limits.

In *Trigonantheæ* nearly every species has cladogenous and postical ♀ flowers; yet a few species of *Cephalozia* have terminal flowers, and sometimes both terminal and postical on the same individual. In *Epigonantheæ*, on the contrary, the rule is to have acrogenous ♀ flowers; yet in *Chiloscyphus* they are distinctly cladogenous, while, without flowers, the plants so much resemble *Lophocoleæ*—or sometimes *Leioscyphi*—that it is often impossible to assign them to their proper genus.

The leaves of *Epigonantheæ* are succubous in every species. In *Trigonantheæ* they are succubous or transverse in *Cephalozia* and its immediate allies, but incubous in all others.

I have throughout endeavoured to collocate the Marsupiocarpous genera by the side of those which so nearly resemble them in every respect, except that their perianth is not a pendulous pouch, as to leave no doubt of their not-very-remote origin in a common ancestor. This is the natural method; although it would doubtless be much easier, and is more convenient for

* See also below the note to *Jungermania cordifolia*.

an artificial conspectus, to treat of the pouch-fruited species as a family apart.—The term "*Geocalyceæ*," applied to these plants by Nees and Gottsche, does not always correctly express their habit; for not all bury their pouches in the earth: *Tylimanthus* hangs them among adjacent mosses, and on the Amazon the pouches of *Kantia* are often buried in the decaying wood of the prostrate trunks on which some of the species love to grow.

CONSPECTUS GENERUM.

A. *Perianthium normale, erectum.*

a. *Per. ab involucro liberum.*

* *Per. constanter trigonum, macrostomum. Bracteæ ♂ monandræ.*

† *Acrocarpicæ: fl. ♀ in caule ramove (raro abbreviato) terminales.*

21. LOPHOCOLEA. Caulis prostratus æquifoliatus, ramis prostratis vel assurgentibus. F. decurvula convexa, apice varia, sæpius bifidula vel truncato-biapiculata, raro integra. F^{la} bifida vel plurifida. Per. pro m. oblongo-linearive-prismaticum, sæpe trialatum, raro solum obtuse trigonum, ore trilabiatum, labiis bifidis sæpe laciniatis.

22. CLASMATOCOLEA. Pusilla, fragilis. Caulis brevis densifolius apice florifer, basi radicante ramos tenues arcuantes, folia parva dissita obcordato-cuneata gerentes, proferens. F. caulina assurgentia concava obovata rotundata retusave. Per. fragillimum obovatum, obscure angulatum, ore hiante 2–4-fidum.

†† *Cladocarpicæ: fl. ♀ ramulo postico brevissimo constantes.*

23. CHILOSCYPHUS. Folia et foliola iis *Lophocoleæ* subconformia; flores autem cladogeni; bracteæ ♀ pauciores, solum 1–2-jugæ, minutæ; calyptra carnosa ultra perianthium sæpe protrusa.

** *Per. a latere compresso-planum, anceps, macrostomum, normaliter eplicatum. Bracteæ ♂ 1–10-andræ.*

24. LEIOSCYPHUS. Folia opposita, cum foliolo majusculo bifido in verticillum connata, margine subintegerrima. Per. exalatum ore sæpius edentatum.

26. PLAGIOCHILA. Folia utplurimum insigniter dentata ciliatave; vel alterna foliolis nullis, aut parvis et inconspicuis, stipata, vel opposita foliolis omnino orbata. Per. ad acies (anticam præcipue) frequenter alatum, ore semper fere ciliatum spinosumve.

*** *Per. turgidiusculum, sæpissime plicatum; ore constrictum, subinde initio clausum, demum valvatim ruptum.*

† *Folia opposita, per paria connata.*

27. SYZYGIELLA. Plagiochilæ quoad foliaturam simillima, perianthio autem pluricarinato ore constricto distat. F^{la} nulla.

†† *Folia alterna.*

30. LIOCHLÆNA. Per. cylindricum arcuatum eplicatum abrupte microstomum.

31. JUNGERMANIA. Per. forma varium, plerumque subovatum, tota longitudine, vel saltem apicem versus, plicis carinisve 3–10 percursum, rarissime eplicatum. F. integra, bifida vel 3–5-loba. F^{la} nulla vel parva, forma varia.*

* Pro *Jungermaniæ* subgenerum caracteribus videas infra.

b. *Perianthium basi vel altius bracteis adnatum.*

32. NARDIA. F. iis *Eujungermaniæ* similia, in *Eunardia* foliolis subulatis adjectis; bracteis 2–5-jugis oppositis perianthio (immerso) alte adnatis; perianthio indistincte 3–5-angulo, apice primum clauso. In subg. *Eucalyx*, bracteæ 1–2-jugæ, nonnisi interiores perianthio subemerso paulo adnatæ; foliola nulla. In subg.? *Apotomanthus* foliola adveniunt majuscula lanceolata torta; per. emersum teres superne indistincte plicatum, ore truncatum, basi bracteis brevi spatio adnatum.

B. *"Perianthium" marsupium pendulum, in terra radicans, vel in muscis substratis nidulans, in generibus Andinis semper in caule terminale, sistens. Folia succuba.*

a. *Calyptra libera, pistillidiis basi sterilibus obsita. Folia opposita.*

25. CALYPOGEIA. Pusilla, facie foliisque *Southbyæ tophaceæ*. F. confertissima tenerrima, utrinque per paria basi connata, prælata et obliqua, subintegerrima. Marsupium cylindricum, ore squamulis pro m. triseriatis cinctum.

b. *Calyptra cum marsupio concreta, apice solo libera et pistillidiis sterilibus onusta. Folia in Americanis alterna.*

28. TYLIMANTHUS. Caules elati, e caudice rhizomatoso orti, habitu *Plagiochilæ*. F. subdimidiata, margine antico recurva; apice truncato emarginata, rarius rotundata, cum margine postico plus minus denticulata serrulatave. Marsupium cylindricum, ore subnudum.

29. SYMPHYOMITRA. Prostrata, facie *Liochlænæ*. F. linguæformia integerrima, margine antico plana. Marsupium cylindricum, ore squamulis laciniatis in annulum duplicem connatis cinctum.

33. ACROBOLBUS. Humilis prostrata, facie foliisque bifidis *Jung. ventricosam* mentiens. Br. magnæ plurilobæ crispatæ. Marsupium subglobosum, ore nisi pro pistillidiis subnudum.

XXI. LOPHOCOLEA, Dum.

Recueil (1835); Nees, Hep. Eur. (1836).

Plantæ sat grandes, rarissime pusillæ minutæve, molles et flaccidæ, virides vel albido-virides, nunquam roseæ, in sicco flavidæ, badiæ luridæve, graveolentes raro fragrantes, strato pro more tenui perlate effusæ. *Caules* radicellis crebris longis albidis repentes, æquifoliati, vage ramosi, raro subpinnati, sat crassi, in speciebus robustioribus stratis concentricis sub 7 conflati; cellulæ parvæ, extimæ quadratæ vel oblongæ, interiores lineari-prismaticæ. *Rami* vel prostrati et radicantes vel assurgentes suberective, omnes laterales vel postico-laterales (e folii lateralis angulo postico exeuntes), nullo flagellari. *Folia* sat magna tenuia, in omnibus Europæis alterna, in plurimis tropicis opposita, succuba, latâ basi antice longius in caule decurrente, postice breviter arcuatâ inserta, oblique ovato-oblonga vel persæpe subtriangularia, apice lato truncato recte vel exciso-bidentata biapicu-

latave, raro perfecte explanata, plerumque convexa decurvulave, rarius recurvo-secunda; margine antico rectiore, basi præcipue recurvo, postico rotundato vel sæpe rectiusculo, toto margine integerrimo, vel in paucis plus minus serrulato, ciliato spinosove. *Cellulæ* majusculæ mediocresve, raro parvæ, leptodermes vel in aliis paucis ad angulos incrassatæ. *Foliola* ubique præsentia, foliis 2–4plo breviora, cuneata vel subquadrata, in *Alternifoliis* bifida, interdum utrinque unidentata; in *Oppositifoliis* pro m. 4–8-laciniata, laciniis sæpe capillaceis, utrinque isthmo angusto decurrente cum foliis collateralibus connata. *Flores* dioici vel monoici (rarissime paroici). *Andrœcia* rami apicem mediumve, rarius totum tenentia; bracteæ plurijugæ, parvæ, superne recurvæ bifidæ, basi erecta antice lobulo turgido incurvo unidentato, antheridium solitarium magnum fovente auctæ. *Flores* ♀ in caule et ramis (raro abbreviatis) terminales; bracteæ subtrijugæ, foliis parum diversæ, submajores, magis frequenter laciniatæ spinosæve; bracteolæ paulo breviores, foliolis apice subconformes, plerumque liberæ, vel basi solum cum altera bractea connata. *Pistillidia* 18–30. *Perianthium* emersum, trigono-prismaticum, sæpius oblongum 2–4plo longius quam latum, raro brevius et urceolatum, angulis (antico præ aliis) in speciebus tropicis persæpe dentato-alatis, in europæis semper fere nudis, cristulis facialibus in paucissimis interjectis; ore trifidum (trilabiatum), labiis bifidis persæpe laciniatis ciliatisve; leptoderme, solum ipsa basi bi-(ad angulos tri-) stratum. *Calyptra* subduplo brevior obovata tenuis, demum apice lacera, basi pistillidiis sterilibus cincta. *Capsula* in pedicello alte exserta, plerumque oblongo-globosa, ad basin usque 4-valvis, 5-strata; cellulæ strati extimi tesselatæ, sat crassæ, pariete incrassato et columnis fuscis 3–6 fulcito, interiores tenuissimæ, intimæ fibris semiannularibus pro m. impletæ. *Elateres* elongati dispiri. *Sporæ* minutæ læves.

Hab. et Distr. Lophocoleæ inter tropicos, locis umbrosis tam planis quam montanis abundant; in zona temperata boreali etiam sat frequentes, paucas species autem, omnes ad § "*Alternifoliæ*" pertinentes, sistunt. In regionibus Æquatori vicinis *Alternifolias* solum in Andibus sylvaticis, nullibi infra 1000 metr. alt. vidi, in truncis ramisque putrescentibus et ad saxa; species autem heterophyllæ ad rivulorum saxa præcipue crescunt. *Bicornutæ*, plantæ speciosæ, foliis oppositis truncato-biapiculatis cum foliolo majusculo in verticillum connatis, in planitie et Andium radicibus, vix unquam ad 1000 metra ascendentes, super truncos putridos in plagas latissimas se extendunt. *Plagiochiloides*, foliis latis oppositis spinosis ciliatisve insignes, infra

regionem sylvaticam mediam non descendunt. *Microlophocoleæ*, plantæ minutæ, foliis serrulatis ciliolatisve, interdum pilis papillisve scabræ. species paucas amplectentes, in truncis cariosis necnon ad ramulos foliaque viva crescentes, in sylvis calidis vigent; altera species, *L. tenerrima* mihi, in Andibus subalpinis inter gramina et fruticulos lecta, fortasse aliena erit.

§ 1. ALTERNIFOLIÆ. *Folia alterna, vel utplurimum per paria approximata, nec revera opposita. Foliola bifida, sæpe basi utrinque dente aucta. Flores in sp. Andinis omnibus dioici, in Europæis autem adveniunt etiam paroici et autoici.*

A. *Bidentatæ, foliis sinu plus minus profundo bidentata bilobave.*

1. *L. diaphana.* Majuscula tenera pellucida innovando-ramosa. F. hic majora illic minora, late ovata, sinu apicis rotundato, segmentis apice tenuibus. F^{la} 3plo breviora profunde bifida, laciniis angustis extus unidentatis. Br. foliis angustiores, margine postico sæpe subspinosæ. Per. breviuscula triquetra subexalata, labiis bifidis laciniatis.
2. *L. coadunata.* Parvula, caule haud innovato. F. subconformia ovato-oblonga, sinu vario, segmentis cuspidatis. F^{la} 3plo breviora bipartita, laciniis integerrimis vel basi unidentatis. Br. foliis latiores, magis profunde bilobæ, integerrimæ. Per. foliis 3–4plo longiora, latissime trialata, alis laciniato-ciliatis, ore breviter 3-labiata, labiis laciniatis bifidisve.
3. *L. foliicola.* Tenera, caule haud innovato. F. distantia rotundo-quadrata, ad $\frac{1}{2}$ bifida, sinu rotundato, segmentis triangularibus cuspidatis. F^{la} 3plo minora profunde bifida, pro m. integerrima. Per. carinis lateralibus anguste alatis, antica exalata.
4. *L. blepharoptera.* Pusilla subfasciculato-ramosa, ramis assurgentibus, innovando floriferis. F. ovata, sinu apicis rotundato, segmentis cuspidatis. F^{la} inferiora minuta, superiora increscentia, ad $\frac{1}{2}$ bifida, hinc vel utrinque unispina. Br. foliis conformes, margine subciliatæ. Per. foliis 3plo longiora trialata, alis crebre ciliatis.
5. *L. Canelensis.* A pr. differt caule minus ramoso; foliis apice brevidentatis; bracteis margine laciniatis integerrimisve; perianthii alis laciniatis.

B. *Heterophyllæ. Folia in eadem stirpe apice varia pleraque rotundata retusave, alia emarginato-bidentata.*

6. *L. aberrans.* Pusilla tenera subinnovando-ramosa. F. oblongo-rotunda plerumque retusa. F^{la} duplo breviora subsquarrosa ovalia ultra $\frac{1}{2}$ bifida sæpius integerrima. Per. trigona subcampanulata, subexalata, labiis rude incisis.
7. *L. irrigata.* Majuscula, sterilis, ramis paucis, sæpe parvifoliis. F. a basi latâ ovata retusa vel lunulato-bidentata. F^{la} 4plo breviora subquadrata, profunde bis bifida.
8. *L. brachydonta. L. aberrante* major, lurida. F. sat magna, inferiora retusa, superiora lunatim emarginata, apicibus acutis. F^{la} magna subrotunda ad $\frac{1}{2}$ solum bifida vel quadrifida.

§ 2. BICORNUTÆ. *Plantæ elatæ speciosæ. F. opposita, postice cum foliolo subquadrato profunde* 4–8-*laciniato (rarissime solum* 2-3-*fido) connata, inter-*

dum etiam antice subconnata ; ambitu subtriangularia, apice lato subrecte truncata, angulis in cornicula porrectis. Flores in omnibus (*L. pycnorrhiza excepta ?*) *monoici.*

9. *L. Martiana.* F. subimbricata, triangularia, apice lato bispinosa, sinu rectangulari vel obtusangulo. F^la^ 4plo fere breviora cuneato-quadrata ultra ½ 4-fida. Br. margine postico rude 3–4-laciniatæ ; br^la^ apice truncato longe 4-spina, spinis mediis divaricato-bifidis. Per. trialata, alis lateralibus subdenticulatis, antica trispinosa.

† *L. perissodonta.* Caules elongati in plagas prælatas extensi, ramis floriferis semper fere brevibus. F. late imbricata, longe triangularia apice truncato-bispinosa, sinu lunulari, margine postico medio spina longa armata. F^la^ subtriplo breviora, quadrata, apice ultra ½ in cilia 4–8 fissa. Br. utroque margine spinis longis armatæ ; br^la^ apice 4-spina, spinis mediis 2–3-fidis, margine longispina. Per. trialata, alis omnibus latis longispinis.

10. *L. connata.* Cæspites densi prostrati. F. densa longe triangularia subfalcata, apice truncato exciso-bicornuta, cornibus cuspidatis, margine antico latissime recurvo, postico sub apice 1-dentato. F^la^ 2plo minora subquadrata ad ½ exciso-bifida, laciniis subulatis apice capillaribus. Br. foliis minores subconformes. Per. ovato-fusiformia trialata, alis latissimis superne spinosis.

11. *L. pycnophylla.* Rami fertiles breves simplices assurgentes, steriles prostrati elongati arcte radicantes. F. confertissima ovato-oblonga subrecte truncata, utroque angulo apicali in spinulam 3–4c. longam protracto, cellulis majusculis. F^la^ vix duplo breviora quadrata, apice dentato–4-spina. Br. margine antico unispinæ, postico 3–4-spinæ. Per. linearia triquetra vix subalata.

12. *L. pycnorrhiza.* Prostrata, radicellis creberrimis matrici adfixa. F. densa ovato-rectangularia recte truncata retusulave, angulis rotundatis, vel rarissime altero angulo breviapiculato. F^la^ 3plo breviora longe 4-spina. Br. foliis duplo longiores, marginibus rude paucidentatis. Per. sat magna ovata inflata, apicem versus trigona, exalata.

§ 3. PLAGIOCHILOIDES. Plantæ elatæ speciosæ. Folia opposita sæpe late triangularia, subdimidiata, margine antico recto subintegerrima, postico subrotundato apiceque (angusto) spinis ciliisve longis, 5–10 (raro pancioribus) armata. Foliola magna, utrinque connata, 4–8-laciniata. Flores dioici.

13. *L. columbica.* F. alata basi semiovali-rotunda, antice integerrima vel 1–2-ciliata, postico apiceque ciliis longis 6 vel 7 ornata. F^la^ ½ minora, hastatim 4-partita, raro 6-vel 7-partita. Br. ovato-orbiculatæ, circumcirca longiciliatæ ; br^la^ ovalis ad ½ 4-fida, laciniis pinnatim ciliatis. Per. sat magna, urniformia, trialata, alis haud latis ciliatis, ore breviter trilobo longissime ciliata.

14. *L. trapezoidea.* F. ovato-triangularia, margine antico supra medium, postico toto apiceque 8–10-ciliata. F^la^ duplo breviora ultra ½ in cilia 6–8 subulato-setacea fissa, ubique margine subspinosa. Per. ovata turgida obtuse trigona exalata (vel subalata), ore brevissime trilobo spinoso-laciniata.

15. *L. polychæta.* F. densissima late triangularia, margine antico recto integerrima, postico subrecto valde sinuato-crispo profunde 6–8-spina, spinis sæpe iterum spinulosis. F^la^ paulo minora reniformia, margine sinuato-crispa, 5-fida, laciniis pinnatifido-spinosis. Br. foliis sub-

duplo longiores, validius armatæ. Per. cyathiformia, ore triloba, lobis spinosis; extus cristis 12 (quarum 3 ad angulos primarios cæteris longiores sunt) ornata.

16. *L. thrausta.* Priori habitu similis, fragillima tamen. F. longiora, angustiora undulato-crispa, apice emarginato-bispinosa, margine postico dissite bispinosa. F^{la} duplo breviora, ad medium 6-fida, laciniis integerrimis.

§ 4. *Microlophocolea. Plantæ minutæ. F. opposita vel alterna, subrectangularia, apice acute bifida, margine toto spinulosa ciliatave, interdum facie supera papilloso-pilosa. F^{la} angusta, caule velata, bifida, laciniis subulatis. Flores monoici vel dioici.*

17. *L. muricata?* F. minuta opposita, ad $\frac{1}{5}$–$\frac{1}{4}$ acute bifida, segmentis acutis, circumcirca crebre ciliata, facie supera pilis 2–5c. longis obsessa. F^{la} duplo breviora, superiora increscentia, ligulata, ad $\frac{1}{2}$ bifida, laciniis erectis, ciliata, utrinque cum foliis connata. Fl. monoici: ♀ in ramo simplice terminales. Per. subclavata, juvenilia obscure trigona, adulta compresso-teretia, exalata, pilosissima.

18. *L. Liebmanniana.* F. alterna, vix ad $\frac{1}{5}$ bifida, toto fere margine serrato-ciliolata, facie lævissima. F^{la} 3–4plo breviora bipartita, integerrima. Fl. monoici et dioici: ramo ♀ simplice. Per. maxima tubæformia tricarinata, carina antica serrato-alata, lateralibus subexalatis.

19. *L. tenerrima.* F. alterna, rotundo-quadrata, ad $\frac{1}{2}$ fere biloba, circumcirca subspinulosa, flores ♀ versus 4-loba, lobis mediis bifidis. F^{la} duplo breviora ligulata ad $\frac{1}{2}$ bifida, basi hinc vel utrinque unispina. Fl. dioici. Per. campanulata, obtuse trigona exalata.

1. LOPHOCOLEA DIAPHANA, Spruce.

Hab. Andes Quitenses, in truncis cariosis saxisque ad rivulorum ripas, locis *Valle de Leito* et *Rio de Cusatagua*, prope *Ambato*, alt. 2600^{m}, etiam in monte *Azuay*, alt. 3000^{m}.

F 2·5 × 1·5, 1·6 × 1·4, 1·5 × 1·0; *c* $\frac{1}{2\cdot5}$; f^{la} ·9 × ·55; ·5 × ·3; *br* 2·5 × 1·25; br^{la} 2·5 × 1·0; *per* 4·0 × 1·5, 5·0 × 2·0^{mm}.

Majuscula pallide viridis tenera pellucida, late laxe effusa. Caules 2-pollicares flexuosi plerumque innovando-ramosi.

Folia per paria approximata, hic majora subimbricata, illic minora dissita, late oblique ovata, apice plus minus profunde (ad $\frac{1}{6}$, raro ad $\frac{1}{3}$ usque) bifida, sinu rotundato, segmentis tenui-capillarive- acuminulatis; cellulæ majusculæ subæquilateræ leptodermes fere vacuæ.

Foliola foliis triplo breviora ovali-cuneata profunde bifida, laciniis subulatis acuminatis et vel inæqualiter bifidis vel extus dente auctis, hinc solum cum folio subjecto decurrenti-connata.

Flores dioici: ♀ in ramo, aliquando innovando-prolifero, terminales. Bracteæ foliis æquilongæ, ovatæ, symmetricæ, ad $\frac{1}{3}$ bifidæ, segmentis capillari-acuminatis, sæpius margine postico spinis paucis denticulisve armatæ; bracteola ovalis v. ligulato-oblonga apice bifida, segmentis cuspidatis, margine unidentata v. repando-denticulata.

Perianthia foliis vix duplo longiora oblongo-prismatica, triquetra, angulis exalatis vel (antico præcipue) ala angusta, hic illic deficiente, subspinosa inermive marginatis; ore trilabiata, labiis bifidis laciniatis ciliolatisve.

Variat foliis interdum rotundioribus, apice magis coarctatis, et bracteis multo longioribus. Perianthia in forma Leitensi brevia, campanulata. Foliis ad *L. cuspidatam*, floribus dioicis ad *L. bidentatam*, magis accedit.

2. LOPHOCOLEA COADUNATA (Sw.).

Jungermania coadunata, Sw. Fl. Ind. Occ.

Hab. super truncos putrescentes in sylvis Andium locis *M. Tunguragua*, *Campana*, &c., alt. 1,200–3,000m. In trunco carioso Jamaicæ frigidioris (SWARTZ). In fretu Magellanico (HOMBRON).

F 1·5 × 1·0, 1·0 × ·65 ; *c* $\frac{1}{30}$—$\frac{1}{24}$; f^{la} ·55 × ·35 ; br^{la} 2·0 × 1·8, 2·0 × 1·5 ; *per* 4·0 × 1·5, *ala* ·5 *lata* ; *caps* 1·0 × ·6, 1·0 × ·45 ; *cal* 1·7 × ·75mm.

Parvula pallida, siccando fuscescens, prostrata ; caules pollicares et longiores, vage parce ramosi, pro more paucifolii.

Folia subopposita subimbricata oblique ovato-oblonga bidentata, sinu profunde lunulato, rotundato, raro subacuto, dentibus tenui-cuspidatis ; cellulæ mediocres subæquilateræ leptodermes, fere vacuæ.

Foliola dissita, foliis triplo breviora, cauli subæquilata subovalia, bipartita, segmentis subulatis basi 4c-latis, integerrima vel basi utrinque unidentata ; ramorum ♀ florem versus increscentia.

Flores dioici : ♀ in caule ramisque terminales, innovatione nulla suffulti. Bracteæ intimæ suberectæ foliis sublongiores, sat latiores, magis profunde bilobæ, e margine late recurvo valde canaliculatæ ; bracteola magna, vel subquadrata, apice lato utroque angulo longispina, vel late ovalis ad $\frac{1}{3}$ fere bifida, lobis acuminatis, medio margine utrinque unidentata ; bracteola exterior perpaulo minor.

Perianthia involucrum duplo superantia, triquetro-prismatica, angulis latissime alatis, alis crebre laciniato-ciliatis, ore breviter trilabiata, labiis vel acuminatis et laciniatis vel anguste bifidis, lobulis subulatis subintegerrimis. Calyptra plus duplo brevior, obovata, angusta. Capsula cylindrico-oblonga.

Plantæ masculæ, fœmineis mixtæ, sat ramosæ, subpinnatæ, ramis elongatis tota fere longitudine antheridiiferis ; bracteæ confertiusculæ, apice recurvo acute bifidæ, basi antica lobulo triplo breviore subgloboso-inflato auctæ, antheridium magnum solitarium foventes.

Obs. In M. *Tunguragua* advenit forma foliis duplo minoribus, sinu interdum subacuto ; foliolis caule duplo fere latioribus, pro more profunde bis bifidis.

Var. *parallelogramma* S. Folia rectangularia, vel parum obliqua et rhomboidea—ramorum ♀ basi paululum latiora ovato-rectangularia —ad $\frac{1}{4}$ bifida, sinu interdum subacuto. Foliola caule haud latiora, bipartita, cruribus perangustis sæpe bifidis.—M. *Campana*, ad saxa.

Var. *rivularis* S. Folia solum acuta acuminulatave, sinu lunulato. Foliola 4plo minora vel bis bifida vel sæpius apice 4-spinulosa. Perianthia angustius alata.—*Tarapoto*, in rivuli saxis emersis.

Obs. In exemplis pulchre fructiferis, juxta *Loja* a G. E. MASSEE lectis, calyptra nisi ipsa basi leptodermis, cellulis 4–7-angulis reticulata, apice demum lacera ; perianthium basi 2 cellulas—ad angulos 3 cellulas—crassa, cæterum tenue ; capsula oblonga, subcylindrica, interdum longe ovoidea, 5-strata, stratis interioribus tenuissimis, corticali duplo crassiore ; elateres elongati bispiri ; sporæ minutæ læves.

3. LOPHOCOLEA FOLIICOLA, Spruce.

Hab. Andes Quitenses, in M. *Tunguragua*, super folia emortua.

F 1·2 × 1·0, 1·05 × ·9; *c* $\frac{1}{3-5}$; f^{la} ·35 × ·13, ·4 × ·35, ·6 × ·4; *br* 1·8; br^{la} 1·6 × ·85^{mm}.

Viridis, tenera, arcte adrepens; caules pollicares vage parce ramosi pallidi.

Folia distantia varie patula, rotundo-quadrata, ad medium usque bifida, sinu rotundato, segmentis triangularibus cuspidatis; cellulæ parvulæ æquilateræ pellucidæ.

Foliola foliis 3plo minora, superiora increscentia, erecto-patula, lanceolata v. cuneata, profunde bifida, integerrima vel utrinque 1-spina.

Fl. dioici: ♀ terminales, *sine innovatione*. Bracteæ foliis majores acute bifidæ recurvæ; bracteola cuneato-oblonga breviter bifida, apice subdenticulata (vel non).

Perianthia (valde juvenilia) triquetra, angulis lateralibus anguste laciniato-alatis, antica exalata, ore 3-labiata, labiis bifidis laciniatis.

L. condunatæ certe affinis, ramo ♀ haud innovando, perianthiis alis laciniatis auctis; differt vero foliis *subrotundis, profunde* (*ad* ½) *bifidis*, multo densius textis, et bracteolâ solum breviter bifidâ, utrinque inermi nec 1-spinâ.

4. LOPHOCOLEA BLEPHAROPTERA, Spruce.

Hab. in truncis putridis terraque Andium Peruvianorum sylvestrium, locis *Tavalosos*, *Tarapoto* et monte *Campana*.

F 1·3 × ·95; *c* $\frac{1}{2-5}$; f^{la} *media* ·5 × ·5; *br* 2·0, 1·5; br^{la} 1·8 × 1·3, 1·4 × ·75; *per* 4·5 × 2·0^{mm}.

Pusilla, e pallido-viridi cœrulescens, siccando rufo-badia; caules ½–1-pollicares, basi repentes, subfasciculato-ramosi, ramique assurgentes sæpe innovando-proliferi, paucifolii.

Folia subopposita subimbricata convexo-recurvula oblique ovata exciso-bidentata, sinu plus minus profundo, dentibus cuspidatis subparallelis; cellulæ $\frac{1}{2-5}^{mm}$ subæquilateræ tenues pellucidæ.

Foliola inferiora minuta, superiora sensim increscentia, sicut flores ♀ versus folia subjecta fere æquant, iisdemque utrinque isthmo angusto brevi connata sunt, lato-cuneata, ad medium exciso-bifida, segmentis subacuminatis, hinc v. utrinque spina aucta, quasi inæqualiter 4-fida (3-fidave).

Fl. dioici: ♀ terminales, in ramo sæpe (nec semper) innovando-continuo. Bracteæ magnitudine valde variæ, sæpe foliis sat majores, inter se semper inæquales; forma foliorum sed margine plus minus ciliatæ; bracteola subbrevior cuneato-obovata, apice inæqualiter bi-trifida et subdenticulata; bracteolæ exteriores et foliola proxima magis symmetrice bifida utrinque 1-dentata.

Perianthia foliis plus 3plo longiora lanceolato-oblonga alato-triquetra, alis mediocribus inæqualibus *crebre dentato-ciliatis-laciniatisve*, ore 3-labiata, labiis bifidis ciliatis. (Laciniæ alarum haud raro iterum denticulatæ ciliatæve).

Var. *flaccida*, major, valde innovando-ramosa, ramis ♀ ter quaterve proliferis. Folia flaccidissima, lata basi inserta, ramorum ♀ sæpe margine postico spinula una alterave armata. Perianthia longissima

(5·0–5·5^{mm} longa) alata, alis angustis latioribusve valde spinoso-ciliatis, ore profunde trilabiata, labiis bifidis ciliatisque.—*Tarapoto.*

Var. *cephalantha*, minor, vix semipollicaris. Bracteæ oppositæ, foliis multo majores tenerioresque in capitulum ovale congestæ, intimæ utroque margine (basi præcipue) laciniis longis hamatis armatæ; bracteola vix diversa, bracteis basi connata. Receptaculum alte convexum pistillidia 36 vel plura gerens.—M. *Campana.*

5. LOPHOCOLEA CANELENSIS, Spruce.

Hab. Andes Quitenses, in sylva *Canelos*, ad saxa.

F 1·5 × 1·1; *c* $\frac{1}{2\cdot5}$; *f*^{la} ·55 × ·4; *br* 2·1; *br*^{la} 2·1 × ·6^{mm}.

Flavo-viridis prostrata laxe implexa; caules 1½-pollicares vage subramosi, ramis ♀ assurgentibus.

Folia alterna patulo-decurva oblique ovata, apice subangusto bidentata, sinu lunulato, dentibus acutis raro subapiculatis; cellulæ mediocres æquilateræ leptodermes fere vacuæ.

Foliola dissita foliis triplo fere breviora cuneato-quadrata vel subrhombea, ultra medium subacute bifida, segmentis subulatis acuminatis, sæpius utrinque 1-spinosa.

Fl. dioici: ♀ terminales, innovatione sæpe suffulti; bracteæ foliis dimidio majores, apice bifidæ, marginibus late subrevolutis laciniatæ integerrimæve; bracteola magna, forma varia, subquadrata, ad medium laciniato-trifida, vel oblonga et breviter bifida, margine grosse paucilaciniata.

Perianthia (valde juvenilia) trialata, alis mediocribus laciniatis, labiisque latis grosse laciniatis.

A. L. *blepharoptera* (cui ramis ♀ innovatis convenit) foliorum dentibus solum acutis nec longicuspidatis, alisque perianthii grosse laciniatis (nec crebre ciliatis) differt.

6. LOPHOCOLEA ABERRANS, Lindenb. et G.

Hab. Andes Quitenses, juxta fl. *Bombonasa*, alt. 500^{m}, in terra humida umbrosa etiam in truncis putridis. In Mexico legit LIEBMAN.

F 1·0 × ·8; *c* $\frac{1}{3\cdot0}$; *f*^{la} ·4 × ·25, ·55 × ·3; *br* 1·25 × ·9; *br*^{la} 1·25 × ·6; *per* 2·6 × ·9^{mm}.

Pusilla tenera pallide viridis; caules pollicares prostrati foliosi radicantes, ramos ascendentes subsimplices vel bis terve innovando-proliferos edentes.

Folia per paria approximata subimbricata patentia oblique oblongo-subovatove-rotunda; apice lato retusa, angulis rotundatis, raro truncata, rotundata, tricrenatave, rarissime ad ramulos parvifolios acute bidentata; margine late recurva (unde ligulato-oblonga videantur); cellulæ mediocres æquilateræ leptodermes subopacæ.

Foliola dissita, foliis subduplo breviora, subsquarrose patula, ovalia, paulo ultra ½ bifida, sinu rotundato, segmentis acuminatis, integerrima vel basin versus unidentata, hinc isthmo brevi cum folio subjecto connata.

Flores dioici: ♀ terminales, innovatione prolifera semper suffulti. Bracteæ bijugæ, intimæ foliis submajores, eadem forma sed magis recurvæ, integerrimæ vel repando-crenatæ; bracteola æquilonga, dimidio angustior, lanceolato-ovalis breviter (ad $\frac{1}{5}$–$\frac{1}{3}$) bifida, seg-

mentis acuminulatis, bracteola exterior sat brevior, ad ½ bifida, medio margine utrinque sæpius unidentata.

Perianthia altiuscule emersa trigono-prismatica subcampanulata; angulis exalatis, rarius alâ brevi angustâ—sæpe ad dentes 2 v. 3 prominulos redactâ—auctis, ore trilabiata, labiis grosse inciso-dentatis, interdum bifidis.

Obs. The Mexican plant differs from the Andine solely by the more distinctly-winged perianth. The branches and innovations spring from the inner side of the postical basal angle of a sideleaf and from the contiguous angle of an underleaf, being partially veiled at its origin by both; yet the branch base is never actually contiguous to the underleaf, but to the postical leaf-base, which is itself imbricated by the underleaf. The innovations arise from the leaf next below the two pairs of bracts, or (more rarely) from the axil of one of the outer bracts; and they diverge considerably at each successive innovation from the primary direction of the axis, whether stem or branch.

7. LOPHOCOLEA IRRIGATA, Spruce.

Hab. in rivuli saxis irrigatis prope *Tarapoto* Andium Peruvianorum.

F 1·5 × 1·2; *c* $\frac{1}{3\frac{1}{2}}$; *f*^{ta} ·4 × ·45^{mm}.

Majuscula fuscidula; caules bipollicares prostrati flaccidi flexuosi, ramum hic illic (sæpe parvifolium) ex angulo folii lateralis postico edeutes.

Folia plane alterna, parum imbricata, horizontalia, basi lata oblique longitudinali inserta, ovata, apice varia, rarissime rotundata; alia autem retusa, alia lunulato-bidentata, alia obsolete trilobulata, apicibus obtusis raro acutis; cellulæ mediocres subæquilatero-hexagonæ leptodermes, annulo lato opaco intus circumdatæ.

Foliola sub 4plo breviora, hinc cum folio proximo decurrenti-connata, subquadrata, profunde bis bifida, laciniis subdivergentibus, crebre radicellosa.

L. aberrans, huic affinis, habet folia basi angustiora, ambitu oblonga; foliola pro plantula longiora semel bifida. *L. rivalis* Tayl. foliis e basi latissimâ, multo latioribus quam longis, &c. diversa erit.

8. LOPHOCOLEA BRACHYDONTA, Spruce.

Hab. In rupibus fluvii *Verde* (fl. *Pastasa* affluentis) irrigatis.

L. aberranti L. et G. affinis, major est, lurida. Folia majora, pauca inferiora retusa, superiora lunatim emarginata bidentatave, dentibus brevi-acutis, cellulis paulo minoribus magisque opacis. Foliola duplo majora (·8 × ·65, ·7 × ·65^{mm}) rotundiora ad ½ solum bifida v. inæqualiter quadrifida, segmentis subulatis v. triangulari-acuminatis. Bracteæ subrotundæ, inæqualiter emarginato-bidentatæ, sæpe hinc vel utrinque apicem versus spina armatæ, toto margine hic illic subdenticulatæ; bracteola vix diversa.

L. rivalis Tayl.! ex insulis Falklandicis, folia habet pro more dissita, tenuia, flaccida, *multo latiora quam longa*, basi latissima, apice rotundata retusulave. Foliola iis *L. brachydontæ* conformia nisi ut subcuneata.—Forsan ad *L. aberrantem* propius accedit.

9. LOPHOCOLEA MARTIANA, Nees in Syn. Hep.

Hab. in sylvis ripariis fluminis Amazonum ab ejus ostiis ad radices

Andium usque, super truncos cariosos, locis *Tauaú* prope Pará, *Nauta* intra fines Peruviæ, &c. (R. S.)—In sylvis fl. Amazonum aliisque Brasiliæ provinciis legerunt MARTIUS, SELLO, &c.; in Caribæis insulis MEISSNER, HUSNOT, &c.; in Mexico LIEBMANN.

F 2·1×1·6; *c* $\frac{1}{20}$; *f*^{la} ·6×·5; *br* ♀ 2·3×1·0; *br*^{la} 1·5×1·0; *per* 4×1; *br* ♂ ·8^{mm}.

Robusta prostrata virescens, siccando rufo-badia vel fuscidula, floribunda; caules 2-pollicares valde et subfastigiatim ramosi.

Folia opposita subimbricata (basi ad $\frac{1}{3}$ lat. solum, apice sat dissita) triangularia apice lato suboblique truncato bispinosa, spinis sæpe subdivergentibus, sinu subrectangulari raro latiore vel lunulato; cellulæ majusculæ subæquilateræ leptodermes, endochromio in annulum tenuem opacum coacervato.

Foliola foliis 4plo fere breviora, caule sublatiora, cuneato-quadrata, utrinque cum foliis subjectis decurrenti-connata, ultra dimidium 4-fida, laciniis tenui-subulatis, extimis longioribus patulis.

Flores monoici: ♀ terminales, innovatione nulla suffulti. Bracteæ sub trijugæ, intimæ foliis parum longiores ovato-ligulatæ subfalcatæ apice lunatim truncato-bispinosæ, margine postico plerumque grosse 2–3-laciniatæ; bracteola foliolis 2$\frac{1}{2}$plo longior cuneato-oblonga, apice lato ad $\frac{1}{3}$ longe 4-spina, spinis duabus externis majoribus subulatis acuminatis, internis divaricato-bifidulis. Bracteæ bracteolæque exteriores intimis sensim subminores, parum diversæ.

Perianthia foliis vix duplo longiora lineari-oblonga alato-triquetra, alis sub 4 cellulas latis, anticâ trispinosâ, lateralibus solum repando-denticulatis; ore profunde trilabiata, labiis bifidis profunde paucilaciniatis.

Amenta ♂ longispica, sæpius ramulis tenuibus flori ♀ vicinis constantia; bracteæ plurijugæ argute bifidæ, basi antica in lobulum inflexum inflatum subrotundum denticulatum, antheridium singulum foventem, dilatatæ; bracteolæ cum bracteis utrinque connatæ, *magnæ*, apice bifidæ, laciniis setaceis erectis, margine utrinque 2–3-spinæ.

Var. *elongata*, 3–4-pollicaris, pauciramea pauciflora, sicca rufa. Folia opposita vel solum per paria approximata. Foliola latiora quam longa, 4-partita, sinu medio lato lunulato, laciniis divergentibus æquilongis, vel sæpius extimis sublongioribus. Flores sæpe in ramo perbrevi terminales. Bracteola intima apice lato 4-fida, laciniis subæqualibus, mediis apice bi-trilobulis.—*Tauaú*.

Var.? *furcata*, flore ♀ sæpe e dichotomia, i.e. innovationibus duabus oppositis suffulto. Innovationes illæ apice vel fœmineæ iterumque innovando-prolongatæ vel masculæ determinatæque.—Fl. *Aripecurú* flum. *Amazonum* affluens.

Var.? *platyphylla*. Folia paulo ultra $\frac{1}{2}$ lat. basi imbricata, recte ovato-triangularia, truncata, apice (triplo quam basi angustiora) ad angulos minute corniculata, margine postico distanter bispinulosa, rarissime inermia. Foliola utrinque connata, oblato-cuneata, apice lato 6–7-spina, spinis subparallelis, margine plerumque integerrima raro unispina.—*F* 1·8×1·8 (*basi*) ×·65 (*apice*); *c* $\frac{1}{20}$; *f*^{la} ·8×·9^{mm}.—In monte *Guayrapurina*, sterilis. Quum flores nullos inveni, forsan propria species erit, dioica.

Obs. Caulis *L. Martianæ* validus, subcompressus, sectione ovali 14 cellulas diametro. Cellulæ corticales foliaribus sat minores, in caulis facie supera oblongæ v. subquadratæ, in facie infera duplo fere minores

magisque quadratæ ; interiores, eodem fere diametro, corticalibus multo longiores, longitudine latitudinem 3–4plo excedente, sectione verticali lineari-rectangulares-rhomboideæve.

Foliola utrinque insigniter decurrentia, insertione super caulem figuram alte parabolicam monstrantia, isthmo latiusculo cum utroque folio collaterali connata.

Perianthia unistrata—solum in ipsissima basi bistrata.

10. LOPHOCOLEA MARTIANA Nees. v. PERISSODONTA, S.

(*Lophocolea perissodonta*, Spruce Mst.)

Hab. in truncis cariosis per sylvam Amazonicam, juxta cataractas fl. *Negro* et *Uaupés* præcipue ; etiam circa *Pará*.

F 2·0 *longa*, *basi* 1·2, *apice* ·5, *lata* ; *c* $\frac{1}{20}$; f^{la} ·7 × ·55 ; *br* 2·7–4·0 × 1·5 ; br^{la} 1·8 × 1·4 ; *per* 5·0 × 1·8^{mm}.

Robusta prostrata, pallide viridis, in plagas latissimas extensa ; caules 3–6-pollicares rufi flexuosi tota longitudine densifolii, valde implexi, radicellis copiosis arcte adhærentes, pauciramei, ramis pro more abbreviatis floriferis, nonnumquam bi-trifidis.

Folia horizontalia *plana* opposita, late (basi ultra dimidium) imbricata, apice vix dissitiuscula, elongato-triangularia, apice truncato-bispinosa, sinu lunulari, spinis brevi-subulato-setaceis rectiusculis (subparallelis), margine postico perpaulo convexo medium versus spina longa (raro 2–3) armata ; cellulæ majusculæ fere æquilateræ subleptodermes subvacuæ.

Foliola imbricata, utrinque cum foliis alte connata, foliis fere 3plo breviora, quadrata, apice ultra medium in cilia 6–8 (4–8 cell. longa) inæqualia, plus minus curvula, fissa, margine supra basin bispinulosa integerrimave media basi radicellas plures elongatas proferentia.

Fl. monoici : ♀ in ramo brevi paucifolio (raro tamen ad bracteas solas redacto) terminales, innovatione nulla ; bracteæ sub 3-jugæ confertæ erectæ, intimæ magnitudine variabiles, foliis longiores brevioresve, apice bifidæ, segmentis subulatis, utroque margine plus minus recurvo spinis longis hamatis armatæ ; bracteola brevior, ligulato-oblonga, marginibus longispina, apice truncato dentato-4-spina, spinis mediis apice 2–3-fidis.

Perianthia foliis 2½plo longiora, lineari-lanceolata 3-quetra, angulis alâ latiusculâ longispinâ, infra medium sensim angustatâ integerrimâque, auctis, ore profunde 3-labiata, labiis apice bifidis dein incisis, laciniis omnibus longisubulatis.

Ramo ♀ collateralis, vel ex eodem ortus, advenit plerumque *ramus brevis amentis* ♂ *pinnulatus*. Amenta folium paulo excedentia ; bracteæ parvæ, sub 12-jugæ, oppositæ connatæ, apice recurvo bifidæ, basi antica in lobulum incurvum inflatum dilatatæ, postica cum bracteola interveniente in sacculum coalitæ.

Distincta species videtur foliis longis, apice *recte truncato bicuspidato-cornutis*, medio margine postico *unicornibus* ; foliolis apice plerumque *8-ciliatis* ; bracteis, bracteolis, perianthiique alis crebre longispinis.

A beautiful plant, almost worthy to be regarded as a distinct species, although it cannot be denied that somewhat intermediate forms occur, uniting it with typical *L. Martiana*. The leaves are remarkable for having a large spiniform, or horn-like, tooth about the middle of the

postical margin. The type of the underleaves seems as follows : they are broadly cuneate—at the apex of the segments spreading widely beyond the stem—twice bifid, with rounded sinuses and subulate segments; lateral segments longer and narrower, inner wider and 3-cleft or trispinous; and when all the divisions are nearly equal (as sometimes happens) we have an 8-ciliate or 8-spinose stipule. The bracteoles are on the same plan; cuneato-quadrate, or oblong, cloven to about one-third into 4 subulate spines, whereof the two medial ones are 2–3-spinose at the apex.

A smaller form grows at the cataracts of the Rio Negro, in which the leaves sometimes want the marginal spine, and the underleaves are commonly only 5-spinose.

10. LOPHOCOLEA CONNATA (Sw.).

Jungermania connata Sw. Prodr. Fl. Ind. Occid.

Hab. Andes Quitenses, in sylva *Canelos*, ad truncos prostratos. Per totas insulas Caribæas et in Mexico.

F 1·8 × 1·05 ; *c* $\frac{1}{24}$; *f*^{la} ·9 × ·5 ; *br* 1·6 ; *br*^{la} 1·3 × ·85 ; *per* 4·0 × 1·2^{mm} (*alis exclusis*).

Albido-viridis dense prostrato-cæspitosa; caules 1–1½ pollicares vage subramosa, ramis densifoliis subimbricatis.

Folia opposita dense imbricata, basi vel paulo ultra medium sese obtegentia, apicem versus dissita, subfalcata, longe triangularia, apice truncato exciso-bicornuta, sinu lunato rarius triangulari, cornubus divaricatis *setaceo-cuspidatis*, margine antico latissime decurva, basi longe decurrente cum folio opposito subconnata, integerrima v. raro margine supero apicem versus unispinosa; cellulæ subæquilateræ subchlorophyllosæ, leptodermes angulis parum incrassatis.

Foliola imbricata, cum foliis subjectis alte connata, suberecta, foliis 2plo minora, subquadrata, ad medium usque exciso-bispina (rarissime 3-spina), spinis subulatis capillari-acuminatis erecto-incurvis, sinu lunulato, integerrima vel aliquando utrinque 1-dentata.

Fl. monoici : ♀ terminales, v. persæpe ramulo brevissimo *constantes*, *quasi-laterales;* bracteæ 2–3-jugæ, *parvæ*, intimæ foliis minores eadem fere forma sed oblique emarginato-bispinosæ, recurvo-tortæ, postice sæpius 1–2-spinulosæ : *bracteola bracteis vix diversa*, sed symmetrica et erecta, utrinque 2-spinulosa v. inermis.

Perianthia alte emersa foliis plus duplo longiora, *ovato-fusiformia* trigona, latissime alata, alis superne dentato-spinosis, ore constricto 3-labiata, labiis brevibus bifidis in spinas subulatas implexas incisis.

Amenta ♂ in ramo terminalia; bracteæ pro more paucijugæ, foliis duplo minores, basi lobulo inflato 1-dentato auctæ, superne recurvo-squarrosæ, bifidæ, antice cum bractea opposita, postice cum bracteola parva bifida, in urceolum coalitæ.

A. *L. Martiana* diversa foliorum *cornibus cuspidatis* divaricatis, *foliolis bifidis* (nec quadrifidis), *bracteola bifida* (nec truncato–4-fida) et *perianthiis latissime alatis*. Cum *L. connata* β " foliorum dentibus longioribus," Syn. Hep. convenire videtur.

In eadem sylva, ad fluvii *Verde* ripas præcipue, adest forma foliis brevissime apiculatis, sinu vario plerumque rectilineo, interdum triangulari lunulatove ; foliolis subtriplo brevioribus profunde bifidis, segmentis divaricatis, subulatis rarissime iterum bifidis. Alteram formam (ejusdem speciei ?) in truncis fl. *Casiquiari et Pacimoni* inveni, foliolis magnis

divaricato-bilobis, segmentis trifidis—ad spicas ♂ sæpe 4–5-fidis; cum autem flores nulli aderant forsan dioica erit, itaque diversa species.

11. LOPHOCOLEA PYCNOPHYLLA, Spruce.

Hab. In M. *Guayrapurina* Andium Peruviæ supra truncos putridos, sociâ *L. Martianâ*.

F 1·25×1·0; *c* $\frac{1}{20}$; f^{la} ·65×·6; *br* 1·8; br^{la} 1·4×·7; *per* 4·0×·75, *caps* ·9×·3^{mm}.

Robusta, olivacea, late repens; Caules 2-pollicares vage ramosi, ramis sterilibus elongatis matrici arcte adhærentibus, fertilibus brevibus ascendentibus.

Folia opposita confertissima, basi ultra $\frac{1}{2}$ latitudinem imbricata, ovato-oblonga subtriangularia, marginibus subrectis perpaulo rotundatis, apice lato fere recte truncata, angulis in spinulam 3–4-cellulas longam vix patulam productis; cellulæ majusculæ subleptodermes, 6-gonæ, paulo elongatæ, fere vacuæ. Folia totâ longitudine sese imbricantia, ipsa basi ad $\frac{3}{4}$ lat. usque, apice perpaulo sed distincte obtecta nec dissita.

Foliola foliis vix duplo breviora, quadrata, recurva, apice breviter (vix ad $\frac{1}{2}$ usque) dentato-4-spinosa, cum foliis utrinque alte connata (nec in caule decurrentia), spinis erectis subparallelis.

Fl. monoici; ♀ terminales sine innovatione; bracteæ 2–3-jugæ, interiores foliis submajores, apice magis profunde bidentatæ, margine antico medio 1-spinæ, postico 3–4-spinæ; bracteola lato-ligularis v. subcuneata, apice 2–5-(sæpius 4-)dentata, hinc cum bractea breviter connata.

Perianthia alte emersa, foliis 3–4plo longiora, fere linearia, acute triquetro-prismatica, vix subalata, ore profunde 3-loba, lobis apice bifidis utroque margine laciniis 2–4 subulatis (sæpe implexis) armatis.

Infra fl. ♀ oritur ramulus brevis parvifolius apice masculus; bracteæ paucijugæ, laxæ, foliis sensim sat minores, monandræ.

A. *L. Martiana* differt *foliis confertissimis* apice brevissime bicornibus; *foliolis* quadratis *apice solo breviter recte 4-spinis; perianthiis subexalatis.*

The ♂ ramuli—mostly solitary, sometimes two, opposite or alternate—spring either from the very base of the perianth, or from just beneath the bracts, or 3 or 4 leaves lower down; but I have never seen a proliferous ♀ innovation.

12. LOPHOCOLEA PYCNORHIZA, Spruce.

F 1·3×1·0, 1·2×·8; *c* $\frac{1}{30}$; f^{la} ·4×·5; *br* 2·8×1·8; br^{la} 1·0×·9; *per* 4·0×1·6^{mm}.

Hab. M. *Campana* et *Guayrapurina* Andium Peruviæ, in truncis putridis.

Rufo-badia in plagas densas prostrata; caules 1–1$\frac{1}{2}$ pollicares parum vage ramosi, subtus radiculis numerosissimis flexuosis longis arctissime adhærentes implexique.

Folia opposita dense (ultra $\frac{1}{2}$) imbricata, decurvula, ovato-rectangularia-trapezoideave, recte truncata retusulave, angulis rotundatis—rarissime altero angulo in spinulam 1–3 cell. longam protracto; cellulæ mediocres, fere æquilateræ, subconformes, leptodermes, endochromio opaco latiuscule annulari intus cinctæ. Ad ramos tenues parvifolios subinde adveniunt folia truncato-bidenticulata.

Foliola subcontigua foliis 3plo breviora, ultra medium 4-spina, spinis lateralibus brevioribus, utrinque isthmo angusto folio connata.

Fl. dioici (?): ♀ in ramo terminales, sine innovatione: bracteæ foliis duplo longiores oblique ovato-oblongæ truncato-bidentulæ, margine (præcipue postico) dentibus paucis grossis incisæ; bracteola plus duplo minor subrotunda bipartita, segmentis bifidis, laciniis subtrifidis.

Perianthia assurgentia emersa, foliis caulinis 3plo longiora, ovata inflata, apicem versus trigona, *exalata*, ore *breviter* trilabiata, labiis incisis, laciniis breviusculis, 2 terminalibus paulo longioribus. Capsula alte exserta oblonga, valvulis ruberrimis.

Amenta ♂ apice v. medio rami posita; bracteæ ad 10-jugæ foliis sub duplo breviores, eadem fere forma, lobulo antico incurvo-inflato 1-dentato adjecto.

The plants are impossible to extricate without rupture, so firmly do they adhere to each other by the numerous strong radicles, and I do not satisfactorily trace the connection of the ♂ branches with the ♀ plants among which they were closely interlaced.

13. LOPHOCOLEA COLUMBICA, Gottsche.

In G. L. et N. Syn. Hep. 155.

Hab. Andes Quitenses, in M. *Tunguragua*, ad terram sub Ericearum umbra; in M. *Azuay*, ad ramos. Specimina *L. columbicæ* originalia in monte Pillún—a monte Tunguragua haud longe distante—a cl. JAMESON lecta fuerunt.

F 2·5 × 2·5; *c* $\frac{1}{20}$; f^{la} 1·5 × 1·7; *cilia* 8^{mm} (10 *cell.*) *longa; br* 3·5; br^{la} 3·0; *per* 5·5 × 4·5^{mm}.

Laxe cæspitosa, olivacea rufave; caules 3-pollicares sæpius erecti, subflaccidi parum ramosi, ramis postico-lateralibus.

Folia subopposita paulo imbricata decurvo-convexa, late semiovali-rotunda, v. subrhombea, basi lata obliqua inserta, margine antico recto integerrima v. cilio uno alterove ornata, postico rotundato apiceque longiciliata, ciliis spinisve omnibus 7–8; cellulæ majusculæ, endochromio parco, trigonis magnis rufis.

Foliola foliis dimidio minora, iisdem utrinque isthmo angusto connata, hastatim 4-partita, laciniis 2 mediis erectis parallelis, lateralibus horizontaliter patulis, omnibus setaceo-acuminatis integerrimis v. intus 1-spinosis, basi hinc sublongiora spinulaque aucta.—Foliola aliquando 6-(dein 7-) fida inveniuntur, laciniis lateralibus utrinque binis.

Fl. dioici: ♀ terminales, innovatione suffulti; bracteæ foliis majores ovato-orbiculatæ, toto margine longiciliatæ; bracteola brevior ovalis ad medium usque 4-fida, laciniis pinnato-ciliatis.

Perianthia foliis plus duplo longiora, urniformia, 3-gona, angulis ala mediocri ciliata auctis, nonnunq. ala brevi subciliata utrique faciei interjecta, ore truncato breviter trilobo ciliis longissimis barbata.

Planta mascula tenuior. Folia solum 5-spinosa. Bracteæ ♂ paucijugæ in rami apice confertæ, antice lobulo brevi subquadrato 1–2-spinoso auctæ. Antheridia magna brevi-pedicellata solitaria.

L. Breutelii Gotts. vix diversa species videretur. *L. Orbigniana* M. et N. descripta est "foliis *undique* et longe ciliatis;" forma tamen foliolorum nostrati bene convenit.

In eodem monte *Tunguragua* advenit var. *parvifolia*, omnibus partibus duplo minoribus. Cilia foliorum sub sex, 6–8 cellulas longa. Perianthia vel omnino exalata, vel uno solo latere ala angusta brevi aucta, compressa nec trigona.

Cum priore adest altera var., *longispina*, major, foliis longissime dentato-spinosis, sæpius apice truncato-2–3-spinosis. Perianthia argute triquetra, angulis lateralibus late alatis spinosis, antico angustius alato.—Caules interdum sub flore terminali innovationes sub 4 produnt.

Var. *angustifolia*, tenuior. Folia sat imbricata angustiora, fere rectangularia—vel, basi paulo dilatata, ovato-rectangularia, longispina; spinis 5–8, antica sæpissime obsoleta. Foliola 5-partita, laciniis ciliiformibus inter se patentibus. Andrœcia in ipso caule, medio basive posita; bracteæ 5–10-jugæ, basi antica incurvo-lobulatæ, apice ciliatæ, lobulo ciliolato.—*Hab.* Andes Quitenses in sylva *Canelos* ad truncos putrescentes; *Chimborazo*, ad ramos; Andes Peruvianos, in M. *Campana*, ad terram humidam cum *Sphagno Peruviano*.

14. LOPHOCOLEA TRAPEZOIDEA, Mont.

In Ann. Sc. Nat. 1843, p. 251, t. 8, f.-2.—Syn. Hep. 155.

Hab. Andes Quitenses, in montibus *Chimborazo* et *Azuay*, ad arborum ramos. Ins. *Guadalupa*, in cortice (PERROTET).

F 1·6 × 1·0 (× 1·3, *spinis inclusis*); *c* $\frac{1}{25}$; f^{la} ·75 × 1·0; *br* 2·1 × 2·0; br^{la} 1·5 × 1·5; *per* 4·5 × 2·3^{mm}.

Tenuis, laxe stratificata, rufo-badia. Caules 2–3-pollicares flexuosi paralleli parum ramosi.

Folia opposita, contigua vel subimbricata, fere plana, ovato-oblongove-triangularia, apice subangusto truncato-2–3-ciliata, cætero margine fere toto—vel antico (recto) solum supra medium—ciliata, ciliis omnibus 8–10; cellulæ majusculæ subæquilateræ, ad angulos paulo incrassatæ, endochromio annulum tenuem constante.

Foliola foliis fere æquilata, duplo breviora, utrinque folio connata, subdissita, subrotunda, ab apice ultra medium ciliatim fissa, ciliis 6–8, subulato-setaceis, 2 mediis suberectis, cæteris patulis.

Flores dioici: ♀ terminales, innovatione nulla suffulti. Bracteæ foliis majores recurvæ, late oblique ovato-oblongæ toto margine spinoso-ciliatæ; bracteola brevior oblonga (spinis exclusis), ultra dimidium 4-fida, laciniis lateralibus angustioribus divaricatis, toto margine distanter spinosa, basi cum altera bractea breviter connata.

Perianthia altiuscule emersa, bracteas plus duplo superantia, ovata turgida, obscurissime trigona exalata, ore subconstricto brevissime 3-labiata, labiis spinoso-laciniatis.

Cum descriptione figuraque Montagnei bene quadrat, unicâ differentiâ perianthio exalato; quum tamen eandem variationem in *L. columbica*, *L. bidentata* etc. videamus, pro specifica haud habenda est.

15. LOPHOCOLEA POLYCHÆTA, Spruce.

Hab. Andes Quitenses, ad fluvium *Pastasa* superiorem, locis *Antombos*, *Mapoto*, aliisque sylvæ *Canelos*, ubi ad saxa umbrosa humida cæspites latos depressos format.

F 1·5 × 1·5; *c* $\frac{1}{25}$; f^{la} 1·0 × 1·25; *br. int.* 2·5 × 2·5; *per* 4 × 3^{mm}.

Caules 1–2-pollicares, suberecti, subsimplices vel parce ramosi, ope

radicellarum e foliolorum basi postica exeuntium in cæspitem densum arcte adhærentes.

Folia badia tenuia arctissime imbricata, opposita, basi prælata recta diagonali cauli inserta, patentia, triangularia, margine antico recto integerrima, postico subrecto vel vix rotundato valde sinuato-crispa profunde 6-8-spinosa, spinis tenui-cuspidatis, sæpe divergentibus hamatisve, haud raro iterum spinulosis, apice truncato-bispinosa (ad speciem cornuta); cellulæ majusculæ æquilateræ, pariete valde incrassato, trigonis maximis, endochromio parco sæpius annulari.

Foliola foliis paulo minora, subreniformia, basi decurrente plerumque utroque latere foliis connata, toto ambitu sinuato-crispa, 5-fida, laciniis pinnatifido-spinosis, spinis utrinque 3–5-nis recurvo-canaliculatis.

Flores dioici: ♀ terminales. Bracteæ subtrijugæ, foliis vix duplo longiores, basi per paria connatæ liberæve, subsquarrosæ, toto margine spinosæ, spinis recurvo-canaliculatis implexis, cellulis inferioribus magnis ($\frac{1}{12}$ mm longis) oblongo-hexagonis; bracteolæ foliolis duplo majores subconformes, laciniis spinisque canaliculatis tortis implexisque armatæ.

Perianthia emersa cyathiformia 4mm longa, $7\frac{1}{2}$ mm circumferentia, prismatica, ore truncato-triloba, lobis spinosis, facie externa alis cristisve sub 12 (quarum 3 totam perianthii longitudinem percurrunt, cæteræ paulo supra basin desinunt) flexuoso-spinosis ornata. Calyptra libera, apice irregulariter rupta. Pedicellus validus. Capsula etc. haud visa.

Stirps inter congeneres distinctissima, *Jungermaniam barbatam* primo visu referens.

16. LOPHOCOLEA THRAUSTA, Spruce.

Hab. Andes Quitenses, in rupibus ad pontem *Agoyán*, muscis immixta.

F 2·0 × 1·5; *c* $\frac{1}{24}$—$\frac{1}{20}$; *f*^{la} 1·1 × 1·5mm.

Viridis, cæspitosa; caules suberecti parum ramosi, ramis nonnunquam fasciculatis 3–4-nis.

Folia *fragillima*, opposita, subimbricata, patula, undulato-crispa semiovato-triangularia, apice emarginato-bispinosa, margine antico inermia, *postico bispinosa*, *spinis dissitis* basi latis; cellulæ subæquilateræ subopacæ, vix incrassatæ, endochromio sparso granulato.

Foliola cum foliis utrinque connata, duplo breviora, cum spinis latiora quam longa, ad medium sub 6-fida, laciniis subulatis acuminatis inter se divergentibus.

E specimine incompleto L. polychætæ affinis videretur.

17. LOPHOCOLEA MURICATA, Nees?

Lehm. in Linnæa, IV: G. L. et N. Syn. Hep.?—*Lophocolea pilosa*, Spruce Mst.

F ·4 × ·25, *c* $\frac{1}{50}$, *f*^{la} ·2 × ·1, ·25 × ·125; *br* ·6 × ·35, *br*^{la} ·5 × ·25, *per* 1·5 × ·5mm.

Hab. In M. *Campana* Andium Peruviæ in arboris cortice vivo. Ad Caput Bonæ Spei (ECKLON). Mexico (LIEBMANN). Novo-Zelandia et Tasmania (J. D. HOOKER).

Minuta albescens in plagas circumscriptas tenues effusa; caules breves

repentes foliosi, ramos assurgentes 5mm longos pro more paucifolios edentes.

Folia opposita antice posticeque (foliolo mediante) connata, semiverticalia subimbricata, recurvo-patula oblongo-rhomboidea vel fere rectangularia, ad $\frac{1}{3}$–$\frac{1}{4}$ acute bifida, segmentis acutis sæpe conniventibus, margine toto crebre implexe ciliata, facie superiore, apicem marginemque anticum versus præcipue, papillis piliformibus 2–5-articulatis obsessa; cellulæ parvæ pellucidæ, inferiores rectangulari-6-gonæ, subapicales subrhombeæ, angulis haud incrassatæ, granis chlorophylli paucis rotundis oblongisve continentes, pleræque superne in pilum productæ.

Foliola subdissita recurvula foliis duplo breviora, fl. ♀ versus sensim majora, ligulato-oblonga, ad medium bifida, segmentis erectis acutis, ciliata, epapillosa, basi utrinque foliis connata.

Fl. monoici: ♀ terminales, innovatione nulla suffulti; bracteæ foliis $\frac{1}{2}$ majores ligulato-oblongæ, subobliquæ, recurvæ, apice bifidæ; bracteola paulo minor appressa ovali-ligulata ad medium bifida, ciliata.

Perianthia foliis fere 4plo longiora ovali-cylindrica subclavata a latere compressa, juvenilia obscure trigona, adulta compresso-teretia, *pilosissima*, ore subconstricto (vix plicato) vix ad $\frac{1}{4}$ usque 3-labiata, labiis bifidis conniventibus ciliatis.

Amenta ♂ ramum foliosum terminantia longispica; bracteæ sub 10-jugæ, foliis sensim minores, julaceo-imbricatæ, basi incurvo-concavæ, apice recurvo bifidæ, margine ciliatæ, alternæ, a bracteolis subliberæ, monandræ.

L. muricata in Syn. Hep. descripta est foliolis papillosis et perianthiis ovatis plicatis; cæterum a nostra vix separanda. Omnino eadem videretur *L. horridula* Sande-Lacoste in "Hep. Javanicæ."

18. LOPHOCOLEA LIEBMANNIANA, Gottsche.

Mexik. Leverm. 113, t. 18; var. LEIANTHA, Spruce.

F ·5 × ·35, ·55 × ·35; *c* $\frac{1}{10}$—$\frac{1}{5}$; *f*^{la} ·15; *br* 1·0; *br*^{la} ·65 × ·35; *per* 2·0 × ·75, 2·1 × ·8mm.

Hab. Ad fl. *Aripecurú* (fl. Amazonum trib.), in trunco vetusto; etiam in Andibus inferioribus juxta Tarapoto. In Mexico invenit LIEBMANN.

Minuta, albescens; caules $\frac{1}{4}$-pollicares vage subramosi repentes, rami ♀ assurgentes paucifolii, steriles masculique magis elongati prostrati arcuantesve.

Folia alterna subimbricata, patulo-decurvula, basi fere longitudinali inserta, fl. ♀ versus tamen subopposita magis obliqua v. fere verticalia, subobblique rectangulari-oblonga, apice breviter (vix ad $\frac{1}{5}$) subacute bifida, segmentis triangularibus acutis. Margine toto fere vel saltem a medio ad apicem usque argute inæqualiter ciliolato-serrulata; cellulæ parvæ subæquilateræ subleptodermes, angulis solum paululum incrassatæ, intus rotundo-4–6-gonæ, granis chlorophyll sat magnis in annulum plus minus coacervatis.

Foliola caule haud latiora, foliis 3–4-plo breviora, ad basin usque bipartita, cruribus suberectis subulato-setaceis basi 2c. latis, integerrima, libera.

Fl. monoici et dioici: ♀ in ramo brevi paucifolio terminales, innovatione nulla; bracteæ intimæ foliis subduplo majores recurvo-canaliculatæ paulo magis serratæ; bracteola minor (= br. $\frac{2}{3}$) lanceolato-oblonga ultra medium bifida subserrata.

Perianthia pro plantula *maxima*, foliis c. 4plo longiora, anguste obconica v. potius tubæformia, trigona, angulo antico anguste serrato-alato, laterali altero alâ angustâ subserratâ versus medium desinente percurso, altero omnino exalato, demum fere teretia, ore dilatato breviter 3-labiata, labiis apice bilobis, margine sinuato-crispis serratisque.

Amenta ♂ (sæpe in pl. propria tenuiore longioreque) ramum terminantia; bracteæ foliis sensim minores sub 10-jugæ alternæ, confertæ, basi lobulo turgido unidentato, antheridium solitarium magnum fovente, auctæ, apice brevi recurvo bidentato vix serrulatæ.

L. spinosa G., sterilis solum nota (ex ins. *Hawaii*) probabiliter dioica est, itaque a nostra sat diversa.

Var. FIMBRIOLATA S. Folia ciliolata, ciliis 3–4c. longis. Floresc. semper monoica. Bractea intima sæpe prælonga, dimidium perianthium excedens, ligulato-rectangularis, apice bifida, sinu triangulari, lobulis spinoso-acutis subdivergentibus. Perianthia perfecte lævia, idem ac in stirpe Amazoniensi; in typo autem Mexicano tuberculis sparsa videntur.— *Tarapoto*, in trunco carioso.

LOPHOCOLEA TENERRIMA, Spruce.

Clasmatocolea tenerrima nobis in Mst. olim.

Hab. Andes Quitenses, in M. *Pichincha*, alt. 3000–3700^{m}, ad terram secus rivulos, sociis *J. J. hyalina* var. et *subinflata*.

F ·8×·6, ·6×·5, ·4×·3; *c* $\frac{1}{40}$–$\frac{1}{30}$; *f*^{la} ·4×·2; *br* 2·5; *per* (*juv.*) 2·0×1·2; *caps* ·5^{mm}.

Pusilla $\frac{1}{4}$-pollicaris pallide viridis, cæspitosa. Caules basi subramosi, ramis sterilibus arcuato-radicantibus, fertilibus brevissimis erectis.

Folia assurgenti-secunda, alterna, subimbricata, rotundo-quadrata-rhombeave, ad medium fere biloba, lobis acuminatis, toto margine parce spinuloso lacinulatove; superiora (fl. ♀ versus) 4-loba, lobis mediis bifidis, laciniis omnibus subulatis; cellulæ parvulæ hexagonæ, inferiores subelongatæ, tenues, fere vacuæ. Folia ramorum sterilium minora, rhomboidea, apice 2–4-fida, cæterum subintegerrima.

Foliola foliis duplo breviora, caule subangustiora, ligulata, ad medium bifida, laciniis subulatis erectis; superiora ramorum ♀ perpaulo majora, basi hinc v. utrinque unispina.

Flores dioici: ♀ terminales, sine innovatione. Bracteæ foliis 3plo majores subrotundæ cochleato-concavæ, apice inæqualiter laciniatæ, cætero margine denticulatæ; bracteola bracteis brevior, longe angustior, lanceolato-ligulata, ad medium biloba, lobis erectis acutis, spinulosa.

Perianthia (juniora) immersa, campanulata, obtuse trigona, exalata, ore triloba, lobis paucilaciniatis. (Unicum maturum jam semidestructum vidi: calyptra tamen relicta, sat brevis, ovalis, crassiuscula, strato cellularum unico conflata. Capsula majuscula oblonga.

This little plant is so disfigured by the apices of the leaves being dissolved into propagula as to be difficult to describe. Its characters are somewhat anomalous. The toothed leaves seem to place it near *Lophocolea Liebmanniana;* but neither that nor any other *Lophocolea* has assurgent leaves, which point rather to the union of the species with *Clasmatocolea*.

XXII. CLASMATOCOLEA, nov. gen.

Plantæ pusillæ fragiles. *Caulis* primarius brevis suberectus densifolius, e basi radicellosa—interdum etiam sub flore terminali—ramos tenues arcuantes parvi-dissitifolios, apice decurvo sæpe radicantes, proferens. *Folia* alterna, assurgenti-subsecunda, plana vel concava, obovata, rotundata, subtruncata vel retusa ; ramea persæpe obcordato-cuneata. *Foliola* duplo breviora, heteromorpha, pleraque ovato-lanceolata integra, alia autem (superiora præcipue) bifida. *Flores* dioici ; *bracteæ* ? foliis majores, parum diversiformes. *Perianthia* pro plantula magna, fragillima, obovata vel subobconica, superne obscure (vel vix) trigona, ore hiante breviter 2–4-loba. *Capsula* oblongo-globosa, cæteraque fere *Lophocoleæ*.

Hab. et Distr. Specierum trium mihi cognitarum duæ habitant Andes Quitenses, ad terram umbrosam in regione superiore sylvatica; tertia, *Cl. cuneifolia* (Hook.) Spruce, hucusque solum sterilis visa, in montibus Hibernicis a cl. Dna. Hutchins primum inventa fuit.

These curious little plants come very near *Lophocolea*, but are well distinguished by the peculiar habit ; the assurgent leaves, with a plane antical margin—not convexo-deflexed, with the antical margin decurrent and recurved at the base (as in *Lophocolea*) ; the biform underleaves, mostly entire, but some bifid. The perianth, turgid and indistinctly carinate, is so fragile that the slightest touch breaks off the short unequal lobes at the wide mouth.—I cannot doubt that the Irish *Jung. cuneifolia* Hook. Brit. Jung. t. 64, hitherto known only from sterlile specimens, is a true *Clasmatocolea*. Specimens gathered a few years ago on Mt. Brandon, by M'Ardle, are so like the arcuate barren shoots of *Cl. fragillima*, that until I compared them closely I thought them the same species. The Irish plant (like the Andine) has both entire and bifid underleaves, and was correctly so described by Nees from original specimens of Miss Hutchins', although Hooker's figure (l. c.) and the E. Bot. figure (t. 2700) show only bifid underleaves.

CLASMATOCOLEA FRAGILLIMA, Spruce.

In monte *Tunguragua*, inter folia emortua, cum *Chætocolea palmata*, Spruce, alt. circiter 2500^{m}.

F ·5 × ·4 ; *c* $\frac{1}{60}$–$\frac{1}{55}$; *f*^{la} ·3 × ·15 ; *br* ·6 ; *per* 1·2 × ·9^{mm}.

Pusilla rufo-badia rigidula, fragilis tamen et fere vitrea. Caules semipollicares basi fasciculato-ramosi ascendentes, prolifero-elongati, innovationibus aliisque ramis apice flexuoso sæpe sensim parvifoliis.

Folia alterna subdissita assurgenti-subsecunda obovato-quadrata cuneatave, apice truncato retusa vel obtuse emarginata ; cellulæ parvæ æquilateræ valde incrassatæ.

Foliola late patentia, foliis vix duplo breviora—magnitudine autem variabilia—ovato-lanceolata acuminata integra, vel profunde bifida, hinc vel utrinque basin versus dente armata.

Flores dioici: ♀ terminales, hinc—raro utrinque—innovatione sæpe prolifera suffulti. Bracteæ bijugæ appressæ, foliis latiores, retusæ vel breviter obtuse 2–3-lobulatæ; bracteola foliolis similis, solum latior. Perianthia alte emersa crassiuscula fragillima, basi saturatius colorata, obovata turgida, a latere parum compressa, vel ecarinata vel carinis duabus posticis subapproximatis percursa, ore lato breviter 2–4-loba cito tamen rupta.

Obs. Rami tenuiores, foliis obcordato-cuneatis et foliolis aliis integris aliis bifidis vestiti, *Jung. cuneifoliæ* Hook. valde similes.

CLASMATOCOLEA HETEROSTIPA, Spruce. (Tab. xx.)

Hab. In monte *Pichincha*, ad semitas umbrosas humidas, *Jung. subinflatæ* (nobis) consociata, alt. 2700–3400^{m}; planta fœm. fertilis.

F ·6 × ·5, ·5 × ·35; *c* $\frac{1}{35}$–$\frac{1}{30}$; *f*^{ta} ·3 × ·1; *br*^{ta} ·8 × ·4; *per* 1·8 × ·8^{mm}.

Pusilla subcæspitosa virescens, siccando badia, pellucida, tenerrima. Caules $\frac{1}{4}$–1-pollicares, basi sola ramosi radicellosique, ramis fertilibus brevibus erectis, sterilibus longioribus tenuioribus arcuatis prostratisve, interdum apice radicantibus.

Folia oblique inserta dissita vel subimbricata assurgenti-secunda, obovato-oblonga vel subquadrata, rotundata vel subtruncata, integerrima, subplana, caulium fertilium majora subconvolutiva, ramulorum parva sæpe obcordato-cuneata; cellulæ mediocres æquilatero-hexagonæ leptodermes pellucidæ, fere vacuæ, marginales quadratæ.

Foliola dissita foliis vix duplo breviora patentia, anguste ovato-lanceolata-subulatave, obtusa acutave, vel persæpe (superiora precipue) apice angusto acute bidentula bifidulave.

Flores dioici: fœm. terminales, innovatione nulla suffulti. Bracteæ vix ullæ nisi folia 2 suprema inter se et a perianthio dissita, cæteris paulo majora rotundioraque, interdum retusa; bracteola libera foliolis inferioribus plus duplo longior ovali-lanceolata obtusata bidentulave.

Perianthia magna, folia triplo superantia, fragillima, clavato-campanulata, a latere compressula, ecarinata, solum apicem versus obscure triplicata, ore truncato hiante breviter 3-(4-) loba, lobis inæqualibus rotundatis—postico rarius acuminato—undulatis, sæpe incurvis, interdum apice bidentatis, cito disruptis. Calyptra sat brevior anguste pyriformis tenuissima. Capsula breviter exserta parvula oblongo-globosa.

Obs. Jungermania subintegra Tayl. est *Lejeunea subintegra* Gottsche in Syn. Hep. 376, cujus stipulæ foliis majores sunt, ovatæ, apice rima vix perceptibili fissæ; mihi autem adsunt specimina sub nom. "*J. subintegra*," e manu cl. Hookeri fil., in Insulis Falklandicis ab ipso lecta, quæ exacte fere cum *Clasmatocolea heterostipa* nostra, habitu, colore, foliis, etc. conveniunt. Plantæ sunt masculæ, elongatæ cæspitosæ, subinde ramum unum alterumve (semper posticum) proferentes. Folia magis ovato-rotunda, subinde retusula, superiora tamen haud raro subquadrata. Foliola iis nostræ plantæ simillima, apiceque eodem modo varia. Androecia medio caule posita; bracteæ plurijugæ, foliis consecutivæ, subminores, convolutivo-imbricatæ, basi antica lobulo incurvo inflato unidentato auctæ. Antheridium unicum (solitarium?) inveni, cæteris bracteis jam vacuis.

XXIII. CHILOSCYPHUS, Corda.

In Opiz. Beitr. (1829); Dum. Sylloge Jung. (1831).

Genus quoad organa vegetativa *Lophocoleæ* omnino fere conforme; *folia* autem rarius apice bifida, plerumque rotundata integerrimaque, vel truncata et 2–3-spina. *Foliola* sæpe ad *Lophocoleæ* instar laciniata, in aliis speciebus autem orbiculata reniformiave, margine dentata, apice vix bifida. *Rami foliosi* persæpe ex angulo postico foliorum lateralium oriundi, idem ac in *Lophocolea; feminei autem constanter postici, foliolis axillares, brevissimi atque simplicissimi. Bracteæ* 1–2-jugæ, exteriores minutæ, interiores semper foliis sat minores, vario modo fissæ. *Pistillidia* 5–30, sterilia libera. *Perianthium* parvum, obconicum vel campanulatum, solum superne trigonum, nunquam alatum, ore trilobum, lobis plerumque spinosis, postico sæpe bifido. *Calyptra* carnosa, inferne 4–8-strata, aut subglobosa et perianthio inclusa, aut clavata et alte emersa. *Capsula* in pedicello longo exserta, oblongo-globosa, sub 4-strata, 4-valvis. *Andræcia* iis *Lophocoleæ* subconformia; in speciebus oppositifoliis semper amentis posticis minutifoliis constantia; in alternifoliis autem—sc. in *Ch. polyantho* et ejus var. *pallescente*—caulis ramive partem mediam vel apicalem sistunt; *bracteæ* ♂ foliis consecutivæ et vix breviores, basi antica lobulo antheridium magnum velante auctæ.

Hab. et Distr.—In zona temperata australi, necnon in terris calidis Capricorni tropici vicinis majore copia crescunt *Chiloscyphi;* in zona temperata boreali paucas species cognovimus; in America sub Æquatore speciem solitariam in Andium devexis orientalibus invenire potui. In terra rupibusque humidis et ad arborum truncos vetustos vigere solent.

1. CHILOSCYPHUS POLYBLEPHARIS, Spruce.

Hab. Andes Quitenses, in spelunca ad *Antombos* (alt. 1500^{m}); *var.* β ad arborum truncos cum *Plagiochilis* in monte *Tunguragua*, et in scopulis humidis montis *Pichincha*, alt. 2700^{mm}.

F 1·5 × ·8, *c* $\frac{1}{4}$; f^{la} ·8 × ·8; *br* 1·25; br^{la} 1·6 × ·8; *per* 2·5 × 1·0^{mm}.

Tenuis flaccida albido-flavicans depresso-cæspitosa. Caules prostrati ramos paucos 1—1½ poll. longos ascendentes simplices, vel ramulis ♂ et ♀ pinnulatos, proferentes.

Folia opposita subimbricata subplana, vel margine recurvula, caulina subtriangulari-ovata, ramea ovato-oblonga, apice truncato 1—3-cuspidata, a medio ad apicem spinoso-ciliata, ciliis omnibus sub 8, plerumque rectis; cellulæ majusculæ subæquilateræ leptodermes, endochromio annulari opaco excepto, pellucidæ.

Foliola foliis duplo minora subdissita late cuneata, vel cuneato-reni-

formia profunde 6—8-fida—quasi primum 4-fida, segmentis pro more bifidis—laciniis angustis spinæformibus.

Flores monoici: ♀ ramo postico brevissimo constantes. Bracteæ bijugæ, exteriores minutæ angustæ, interiores foliis sæpius subminores oblongæ, toto margine spinosæ, teneræ; bracteola longior, oblonga ultra medium bifida, segmentis angustis acuminatis squarrose spinosis.

Perianthia foliis vix duplo longiora campanulata compressula exalata, ore breviter 3-labiata, labiis bifidis, lobulis ciliatis, ciliis longissimis, 12-17-cellulas longis, erectis.

Andrœcia tenuia amentiformia, foliolis axillaria, foliis contigua et parallela, iisdem subæquilonga; bracteæ ad 10-jugæ julaceo-imbricatæ, vix confertæ, oblongæ, canaliculato-concavæ, apice digitatim ciliato-fidæ, monandræ; bracteolæ ovales, apice ciliatæ.

Var. *β speciosa* S.

F 2·7 × 2·0, *cilia* ·15, *cellulæ* $\frac{1}{20}$; *f* 1·8 × 1·8; *br* 3·0 × 2·3; *br*^{a} 1·9 × 1·9; *per* 4·0 × 3·0; *amenta* ♂ 1·0, *br* ♂ ·6–·8^{mm}.

Major; caules 2–3-pollicares. Folia duplo fere majora, latiora, toto margine, basi antica excepta, spinoso-ciliata, ciliis sub 15, ad 10 cellulas longis, varie hamatis. Foliola magna, foliis solum dimidio breviora, toto margine longiciliata, ciliis 12–15. Amenta sæpe opposita, singula binave ex utroque folioli angulo orta.—Diversa species videretur, cum typo autem sedulo comparata, ab eodem haud separanda.—Planta Pichinchensis foliola habet prælata (1·0 × 1·5^{mm}).

Obs. The two male catkins, standing one on each side of an underleaf—more rarely four catkins, two on each side—with a vacant middle space (as it were for the reception of a female flower, which is obsolete) suggest an analogy with *Kantia*.

XXIV. LEIOSCYPHUS, Mitt.

In Hook. Antarct. Voy. P. 2, p. 134 (1853). *Leptoscyphus* ejusd. in Hook. Journ. Bot. III., p. 358 (1851).

Plantæ pro more elatiusculæ, late depresso-cæspitosæ, radicellosæ, parum ramosæ; rami postici, foliolis axillares; innovationes autem posticæ et laterales. *Folia* succuba opposita, basi anticâ contrariis contigua, posticâ, mediante foliolo, in verticillum trifoliatum connata, oblique oblonga rotundave, subdimidiata, apice rotundata retusave, rarissime subbifida, margine sæpius integerrimo, antico recurvulo decurrente. *Cellulæ* parvulæ vel mediocres, pariete ad angulos valde incrassato. *Foliola* ubique præsentia, foliis subduplo breviora, biloba vel bipartita, laciniis acuminatis; utroque margine inferne 1–3-spina vel integerrima. *Flores* dioici: ♀ in caule, raro etiam in ramis terminales, innovationibus tenuibus, sæpe binis vel quaternis, posticis vel lateralibus, suffulti. *Bracteæ* unijugæ, foliis subconformes, paulo latiores magisque armatæ. *Pistillidia* 12–16. *Perianthium* liberum, a latere compressum, oblongum, ad apicem fere usque æquilatum, vel superne paulo latius, inferne turgidiusculum,

ore complanatum truncato-bilabiatum integerrimum vel incisulum, omnino eplicatum, rarissime (facie tertiâ posticâ perangustâ adjectâ) obtuse trigonum. *Calyptra* pyriformis, basi pistillidiis sterilibus obsita. *Capsula* altiuscule pedicellata, oblonga, 4-valvis (perfecta haud visa). *Elateres* dispiri. *Andræcia* in caule ramove apicalia mediave, spicata; *bracteæ* sub 10-jugæ, lobulo antico incurvo auctæ, monandræ.

Hab. et Distr. Leioscyphi in montibus tropicis et australioribus haud infrequentes, in temperatis borealibus nondum (quantum scio) inventi fuerunt. In Andibus sylvaticis 4 species, ad terram inter folia emortua, ad saxa humectata, raro ad truncos vetustos legi. Quintam speciem, a me prætervisam, legit amicus JAMESON.

There can be no question of the close affinity of this genus to *Lophocolea*, especially to the opposite-leaved species. The flattened, ancipitous perianth of *Leioscyphus* is an essential distinction, except when (as happens occasionally in certain species) a narrow postical face is superadded, making the perianth obtusely trigonous, and thus far assimilating it to the perianth of *Lophocolea*, whose deeply 3-lobed mouth, with each lobe bifid and often laciniate, however, is widely different from the truncate and entire, or very slightly cut, mouth of the perianth of *Leioscyphus*. The ramification affords an additional distinction, for the branches of *Leioscyphus* are normally *postical*, rarely springing from mid-axil of an underleaf, but towards one angle of it; and sometimes a pair arise from the same axil, diverging to opposite sides of the stem, then assurgent. The subfloral branches, or innovations, however, spring occasionally from the lower axillary angle of a *side-leaf*, or bract; and there are instances of four collateral innovations, two from the axil of the underleaf, or bracteole, and one from the axil of each of the lateral bracts. —*Southbya*, nobis in Ann. Nat. Hist. 1849, the nearest ally of *Leioscyphus*, differs by its humble stature; creeping stem, with numerous long radicles; underleaves in the typical species none, where present minute and either simple or bifid; but especially by the ♀ bracts being adnate to the shortly-emersed ancipitous bilabiate perianth. *Apotomanthus* n. gen., to be described below, differs from *Southbya* mainly in its trigonous perianth.

1. *L. Liebmannianus.* Elata. F. late oblique semicordato-ovata, rotundata. F^{la} duplo breviora ovato-rotunda ad ½ bifida, laciniis a basi lata tenuiacuminatis, basin versus utrinque sub 3-spina. Br. oblatæ, cæterum foliis conformes; br^{la} oblonga, profunde bifida, juxta sinum unispina, margine externo utrinque spinis longis sub 5 armata. Per. oblongo-cylindracea, compressa, ore truncato integerrima.
2. *L. Chamissonis.* Humilis. F. late obovato-oblonga, rotundata, retusa vel bifidula. F^{la} duplo breviora ovato-lanceolata ad ½ bifida, integerrima vel basi unidentata. Br^{la} ovali-rotunda crispata brevissime bifida, infra apicem in angulum lobulumve externe prominula. Per. campanulata oblonga, compressa, ore in lobulos 5 obtusos crispatos incisa.
3. *L. schizostomus.* Mediocris. F. dimidiato-ovalia rotundata. F^{la} sursum crescentia, inferiora foliis sub 4plo, superiora vix 2plo minora,

lineari-oblonga, ultra ½ bifida, prope basin utrinque spina divergente armata. Br^{la} bis bifida, cæterum foliolis conformis. Per. campanulata, compressa, ore truncato sinuoso-incisa.

4. *L. obcordatus.* Mediocris. F. subsemicordato-quadrata, apice lato oblique emarginata obcordatave. F^{la} vix duplo minora bipartita laciniis subulatis tenuiacuminatis, utrinque basin versus bispinosa.

5. *L. fragilifolia.* Elata fragillima. F. magna, minus exacte opposita oblique orbiculata concavissima. F^{la} paulo breviora, late cuneata profunde bifida, segmentis subbifidis.

1. LEIOSCYPHUS LIEBMANNIANUS (L. et G.).

Jungermania L., Lindenb. et G. Syn. Hep. 668; Gottsche Hep. Mexic. 122.

Hab. In M. *Tunguragua*, ubi alt. 2400–3000^{m} sub Ericearum umbra pulchre viget; necnon in M. *Pichincha.* In Mexico legit LIEBMANN.

F 1·0 × ·9, ·75 × ·62; *c* $\frac{1}{40}$–$\frac{1}{32}$; f^{la} ·55 × ·4, ·45 × ·4, ·3 × ·25; *per* 2 × 1·25; br^{la} 1·05 × ·4 (*vel* × 1·0, *spinis inclusis*) ^{mm}.

Elata, late cæspitosa rufescens. Caules 2–3-pollicares, erecti radicellisque suis intexti, v. prostrati, parum ramosi; rami innovationesque (subflorales) postici subparalleli.

Folia subimbricata assurgenti-subsecunda, opposita, latâ basi diagonali inserta, antice vix decurrenti-connata, postice foliolo mediante plerumque coalita, obliqua v. subdimidiata, late semicordato-ovata rotundata, integerrima, margine supero juxta basin recurvula; cellulæ parvulæ æquilateræ, trigonis conspicuis incrassatæ, pellucidæ.

Foliola subduplo breviora ovato-rotunda ad medium bifida, laciniis a basi lata tenui-acuminatis, margine inferiore utrinque sub 3-spina, spinis hamatis.

Flores dioici; ♀ terminales, innovatione unica, v. 2 oppositis, suffulti. Bracteæ 1-jugæ, latiores quam longæ, et vix aliter a foliis diversæ; bracteola foliolis mediis duplo longior, oblonga, profunde bifida, segmentis tenui-subulatis, intus juxta sinum unispinis, margine utroque externo infra sinum 5-spinosa, spinis prælongis hamato-decurvis.

Perianthia foliis duplo longiora, oblongo-cylindracea compressa ore deflexo fere recte v. subundulato-truncata, ancipita, ab apice utrinque brevi spatio fissa.

Planta ♂ tenuior magis ramosa. Amenta ramum brevem ex parte tenentia, foliis normalibus paucis basi apiceque aucta; bracteæ ad 10-jugæ, foliis minores, arcte imbricatæ, a basi ad medium complicato-lobulatæ, lobulo turgido margine inflexo bidenticulato antheridium unicum magnum amplectente.

2. LEIOSCYPHUS CHAMISSONIS (L. et L.).

Jungermania Ch. Lehm. et L. in Syn. Hep. 668.

Hab. Andes Quitenses, in rivuli *Cusatagua* saxis prope *Ambato.* In Chili invenit CHAMISSO.

F ·7 × ·75, ·8 × ·75; *c* $\frac{1}{40}$–$\frac{1}{36}$; f^{la} ·35 × ·15; br^{la} 1·0 × ·75; *per* 1·8 × 1·0^{mm}.

Humilis cæspitosa virescens, siccando fuscidula. Caules humiles semipollicares ascendentes radicellosi parum ramosi, aliis ramis parvifoliis.

Folia subimbricata distiche patula vel assurgenti-secunda, a basi lata obliqua (vel inferiorum fere longitudinali) late obovato-oblonga subrotundave—alia latiora quam longa—apice rotundata sæpiusve late

retusa, raro breviter bifida, cellulis quadratis marginata; cæteræ cellulæ parvulæ subconformes æquilatero-hexagonæ subpellucidæ.

Foliola dissita patentia, foliis duplo breviora, ovato-lanceolata, vix ad dimidium usque bifida, segmentis subulatis incurvo-conniventibus, integerrima vel rarius hinc vel utrinque dente suprabasali aucta.

Flores dioici: ♀ terminales, sæpius sine innovatione. Bracteæ foliis longiores subconformes flaccidæ; bracteola ovali-rotunda undulato-crispa, apice brevissime bifida, infra apicem vel angulata vel utrinque parvilobulata.

Perianthia foliis duplo et ultra longiora, campanulato-oblonga valde compressa, ore bilabiata et in lobulos 5 obtusos crispatos fissa.

3. LEIOSCYPHUS SCHIZOSTOMUS, Spruce.

Hab. In monte *Campana* Andium Peruvianorum, supra folia emortua repens.

F ·9 × ·65, ·6 × ·4; *c* $\frac{1}{40}$; *f*^{la} ·25 × ·15, ·5 × ·4; *br* 1·0 × 1·05; *br*^{la} ·8 × ·5; *per* 1·1 × ·9^{mm}.

Rufo-badia prostrata; caules 1–2-pollicares flexuosi æqualiter foliosi radicellosi, fere simplices v. ramos perpaucos necnon innovationem subfloralem posticos (ex angulo—vix ex media axilla—folioli oriundos) edentes.

Folia contigua vel subimbricata, opposita, angulo axiali 90° divergentia, basi breviusculâ diagonali inserta, dimidiato-oblonga-ovaliave rotundata repanda, raro oblique retusula, margine antico convexo basin versus recurvo-constricta, cæterum subplana; cellulæ parvulæ omnes fere æquimagnæ, subæquilateræ, trigonis majusculis, endochromio parco, subpellucidæ.

Foliola subcontigua, sursum crescentia, inferiora foliis fere 4plo, superiora vix duplo, minora, lineari-oblonga v. cuneata, ultra medium bifida, laciniis subulatis acutis suberectis, basin versus utrinque spinâ lacinulâve divergente, foliolorum superiorum longiore inferiorum breviore obsoletâve.

Flores *dioici:* ♀ terminales, innovatione (raro iterum floriferâ) suffulti. Bracteæ foliis majores, oblique subrotundæ concavæ repandæ; bracteola forma foliolorum, subduplo major, laciniis inæqualiter bifidis, prope basin utrinque sæpius unispina. (Pistillidia fl. juniorum ad 16 vidi.)

Perianthia (vix perfecta) parum emersa campanulata vel campanulato-oblonga compressa ore truncato sinuoso-incisa-lobulatave.

L. Liebmannianus folia habet latiora, semicordato-ovata; foliola laciniis tenui-acuminatis, basi utrinque 3-spinosa; bracteolam utrinque longe 5-spinam; denique perianthium ore truncato omnino integerrimum. *L. Chamissonis* foliis latioribus, obovatis vel subrotundis; foliolis et præcipue bracteola magna brevius bifidis, certe distincta videtur.

4. LEIOSCYPHUS OBCORDATUS, Spruce.

Hab. M. *Pichincha*, ad rupes: planta ♂ sola.

F 1·0 × ·95; *c* $\frac{1}{35}$; *f*^{la} ·6 × ·4^{mm}.

Rufo-badia procumbens subradicellosa. Caules 1½-pollicares parum ramosi.

Folia subimbricata opposita, basi anticâ subcontigua, posticâ, mediante foliolo, connata, assurgentia, concava, subquadrata rhombeave, basi lata diagonali affixa; antice subsemicordata leniterque recurvula, apice lato plus minus obliquo emarginato-bifidula obcordatave, lobulis rotundatis; cellulæ subopacæ, æquilateræ, subconformes, trigonis maximis interpositis.

Foliola vix duplo minora, subimbricata, incurvo-arcuata, profunde bifida vel bipartita, laciniis subulatis tenui-acuminatis utrinque basin versus subbispinosa, spinis sæpe hamatis, haud raro etiam intra sinum bispinosa.

Spicæ ♂ juveniles ad ramorum apices adveniunt.

5. LEIOSCYPHUS FRAGILIFOLIUS (Tayl.!) Mitt.

Chiloscyphus fragilifolius, Tayl. in Pl. Jameson. (1848); *Leptoscyphus fr.* Mitt. in Hook. Journ. Bot. (1851).

Hab. Ad arbores secus fluvium *Napo* (JAMESON et VILLAVICENCIO). [Specimina incompleta mihi adsunt.]

Elata badia fragillima. Caules 2-pollicares assurgentes subfastigiatim ramosi basi radicellosi.

Folia magna imbricata per paria subcontigua—vix unquam basi connata, oblique orbiculata concavissima (externe visa bullato-convexa), basi antica subquadrata, postica semicordata; cellulæ parvulæ trigonis magnis ad angulos fulcitæ.

Foliola breviora, utrinque connata, late cuneata, profunde bifida, laciniis iterum bifidis, vel saltem spina magna externe armatis, triangularibus tenui-acuminatis, margine recurvis.

XXV. CALYPOGEIA, Raddi.

Calypogeia, § A *Examphigastriatæ*, Raddi in Act. Soc. Sc. Moden. (1820). *Gongylanthus* Nees, Hep. Eur. II. (1836). *Gymnanthe* Tayl. Mst., pro p., in G. L. et N. Syn. Hep. (1845). *Podanthe* Tayl. Lond. Journ. Bot. (1846). *Lindigia* Gottsch. Mex. Leverm. t. 20 (1863); *Lindigina* ejusd. Ann. Sc. Nat. (1864). *Lethocolea* Mitt. in Hook. Handb. N. Zeal. Fl. (1867).

Plantæ perpusillæ, in cespite depresso intricato crescentes, e toto habitu; caule parum ramoso radicellis crebris repente; foliis succubis confertis oppositis, utrinque connatis; florescentia ♀ terminali, innovationibus binis tenuibus stipata, &c., *Southbyæ* nostræ perfecte conformes; distinguuntur fructu, loco perianthii assurgentis, in marsupio pendulo subterraneo incluso. *Caules* crassi, fragiles. *Folia* tenerrima, basi prælata diagonali inserta, oblique ovato-orbiculata-oblongave, integerrima vel apice lato erosula incisulave. *Foliola* in plurimis nulla. *Flores* dioici. *Involucrum* e bracteis minutis pro more triseriatis, laciniatis, in annulos 3 connatis—subinde ad cilia redactis—demum marsupii os obvelantibus, constans. *Pistillidia* sub 12. *Marsupium* cylindricum pluristratum, intra

orificium papillis internis articulatis fere clausum. *Calyptra* perfecte libera, angusta, basi pistillidiis sterilibus obsita. *Capsula* . . . *Andræcia* caulem ♂ totum sistentia; bracteæ plurijugæ, turgidæ, 1–2-andræ.

Hab. et Distr. Species 12 vel plures hodie cognitæ habitant: 2 in Europa australi, cæteræ in terris tropicis et austrinis; in Andibus 2 species legi. In terra saxisque subhumidis umbrosis crescunt.

CALYPOGEIA ONISCOIDES, Spruce.

Hab. Andes Quitenses, ubi in umbrosis montis *Guayrapata* supra terram et muscos adrepit, alt. 2700–3000^{m}.

F 1·5 × 1·6, 1·5 × 1·3, *f. ramea* ·9 × ·9, ·8 × ·9, *c* $\frac{1}{40}$–$\frac{1}{20}$; *marsupium* 1·8 × 0·9^{mm}.

Pusilla albicans tenerrima depresso-cæspitosa. Caules $\frac{1}{2}$-pollicares prælati carnosi, radicellis crebris longissimis sordide albidis subtus villosi, apice solo assurgentes subarhizi, simplices vel subramosi, ramis sæpe brevibus gemmiformibus.

Folia pro plantula magna, confertissima, opposita, utrinque connata, longe oblique inserta, assurgenti-conniventia, late ovato-orbiculata, basi subcordata exindeque subreniformia, integerrima vel (terminalia præcipue) margine scarioso erosa; cellulæ leptodermes pellucidæ, vel subconformes vel infra medium solum $\frac{1}{40}$–$\frac{1}{32}$^{mm} diametro, supra folii medium duplo fere majores et scariosæ. Foliola nulla.

Flores dioici: ♀ terminales, innovationibus binis minutis, oppositis vel collateralibus suffulti. Bracteæ foliis longe minores 3-seriatæ, in conos 3 truncatos arcte imbricatos basique inter se leniter adnatos, conniventes; seriei extimæ tres, plus minus connatæ, laterales triangulari-subulatæ, media subquadrata bifida; seriei mediæ in annulum altiusculum irregulariter fissum connatæ; intimæ minores teneriores ad basin fere usque in lacinias inæquales, subulatas, ciliiformes amorphasve fissæ.

Marsupia pendula (subterranea) cylindracea viridia, siccando badia, carnosa, cellulis 8–10-stratis conflata, extus subpapillosa radicellisque setosa, facie interna orificium versus papillis longis articulatis fere horizontalibus obsessa. Calyptra perfecte libera, marsupio fere æquilonga, tennis, cellulis unistratis conflata, basi pistillidiis paucis circumdata, apice bilabiatim rupta.—Marsupia raro vidi binata, altero scilicet laterali, innovationis loco.

Bracteæ pl. ♂ totam fere caulis longitudinem tenentes, foliis minores subconformes, ventricoso-concavæ, arcte julaceo-imbricatæ. Antheridia jam decisa non vidi.

The leaves on each side of the stem arch over towards those of the opposite side, and are so densely imbricated as to simulate sheathing plates or scales; whence the plants resemble woodlice, or other small crustaceans, curled up and laid on their backs.

Gottsche says his *Lindigina granatensis* has *incubous* leaves—doubtless by mistake, for his *L. Liebmanniana* is figured in Mex. Leverm. t. 20, with decidedly succubous leaves, and he considers the two species congeners. The latter differs from my plant in the smaller ovate leaves, not arcuato-connivent so as to veil the upper side of the stem.

CALYPOGEIA EUTHEMONA, Spruce.

Hab. ad aggeres umbrosos, in montis *Tunguragua* radicibus, juxta pagum *Baños*, alt. 1800m.

Caulis sectio ·6 × ·3 ; *f* 1·3 × ·9, $\frac{1}{25}$mm ; *involl* ·5mm latium.

Pusilla viridis prostrata. Caules $\frac{1}{4}$-pollicares, sat lati, compressi, cellulis pluristratis conflati, radicellis crebris prælongis arcte adrepentes, simplices vel e floris ♀ basi postica recte innovando-continui, raro ramum unum alterumve proferentes, flagellis nullis.

Folia tenerrima confertissima, opposita basique anticâ subconnata, assurgentia, oblique ovato-oblonga, apice recurvulo rotundata rarius retusula, angulata vel obsolete 2–3-loba ; cellulæ mediocres leptodermes parum elongatæ, chlorophyllosæ, inferiores subposticæ majores et vacuæ.

Involucra ♀ (juvenilia) terminalia truncato-conica, bracteis 3-seriatis, in annulos 3 angustos imbricatos connatis ; annulus extimus textura foliorum, ore repandus integer vel subtrilobus ; 2 interiores breviores tenuissimi, ore inæqualiter plurifidi lacimative. Pistillidia 12 brevia cylindracea, receptaculo convexulo insidentia.—Cætera haud visa.

Caulis infra florem ♀ subgibbosus valde radicellosus, itaque in marsupium serius deferri procul dubio videtur.—*Lindigina Liebmanniana* Gottsche, Mex. Leverm. 120 t. 20, differt foliis multo latioribus. In icone *late ovata* depicta sunt, *obovata* autem in textu descripta.

XXVI. PLAGIOCHILA, Dum.

Recueil (1835) ; Lindenberg, Sp. Hep. (1839–1844) ; *Radulæ* subdiv. 3, *Plagiochila* Dum. Syll. (1831).

Plantæ speciosæ, plerumque elatæ, interdum pedales, raro pusillæ, cæspitosæ vel inter muscos reptantes. Caudex validus prostratus, subtus radicellis crebris pallidis rufisve matrici adfixus, vage divisus, foliis lateralibus brevibus truncatis demum marcescentibus sparse vestitus, hic illic caules erectos, assurgentes, horizontales, interdum pendulos proferens. *Caules* validi, rufi vel fere nigri, raro pallidi, cellulis angustis pluristratis, exterioribus stratorum 3–5 coloratis, internis pallidis, conflati, subæquifoliati vel e foliis inferioribus parvis truncis dissitis dendroidei, arhizi vel rarissime ad ramos radicellosi ; plerumque dichotome ramosi, in aliis autem pinnati ; rami omnes laterales, e folii axilla sæpius juxta angulum posticum orti. *Folia* omnium fere magna, interdum maxima (1–8mm longa) sat lata et pro more integra, colore varia, raro rosea, succuba, ad lineam anguste parabolicam, antice longius quam postice decurrentem, cauli adfixa, distiche patula vel devexo-secunda, in aliis opposita, in aliis plurimis alterna, obliqua, sæpe quasi-dimidiata, axi excentrico margini antico multo magis approximato quam postico; apice raro

acuta, plerumque rotundata vel truncata, valide dentata spinosave, raro integerrima vel subbifida; margine antico subrecto vel etiam concavo, basi longe decurrente saltem—interdum tota longitudine—recurvo revolutove, raro ab ipsa basi dentato ciliatove, plerumque solum sub apice paucidenticulato vel integerrimo; postico plus minus rotundato—interdum semicirculari—plano, vel in ipsa basi late reflexo, tota longitudine, vel tantum superne, dentato-spinoso-ciliatove, rarissime edentato. *Cellulæ* mediocres vel majusculæ, raro parvæ, subæquilatero-hexagonæ, vel solum inferiores (axiales præcipue) oblongæ, rarissime omnes elongatæ, trigonis angularibus semper fere sat magnis et conspicuis; cuticula sublævissima. *Foliola* in plerisque nulla, in aliis ad squamulas amorphas inordinatim sparsas redacta, in aliis autem ubique præsentia, parva integra vel inæqualiter plurifida, laciniis sæpius flexuosis. *Flores* in omnibus speciebus Americanis sub Æquatore vigentibus dioici. *Andræcia* spicata, linearia vel fusiformia, in plerisque *Grandifoliis* composita, flabellulum terminale subdichotome ramosum sistentia, bracteis minutis semper fere monandris; in *Spinulosis* cæterisque simplicia, terminalia mediave, bracteis parvis 1–2-andris vel majoribus et 3–10-andris. *Bracteæ* ♂ plurijugæ alternæ, julaceo-imbricatæ, transversæ, inferne erectæ ventricoso-saccatæ, utroque margine alte super caulem incurrentes; apice libero erectæ patulæve postice paulo magis quam antice dilatatæ. *Flores* ♀ vel in caule primario vel in ramis terminales, caule in prioribus semper fere iteratim innovato, innovationibus vel solitariis, monotropis, vel sæpius oppositis, unde caulis dichotomus evadit. In posterioribus caulis, antequam in ramulorum apice flores ♀ profert, jam sat ramosus, vel pinnatus vel dichotomus, postea nunquam, vel semel (rarissime bis) sub floribus innovat. *Bracteæ* ♀ 1–4-jugæ, liberæ, foliis majores et latiores, margine crebrius armatæ; in paucis speciebus nullæ propriæ, foliis supremis a perianthio subdissitis, cæteris conformibus, vix pro bracteis habendis. *Receptaculum* alte convexum, pistillidiis numerosis, (25–70) ore hiante sæpe 3–5-spinosis, onustum. *Perianthium* pro m. emersum, bracteis involucri duobus intimis constans, sibi appressis, utroque margine connatis, vel, suturâ alterius bracteæ intramarginali, alâ anticâ (interdum etiam posticâ) percursum. *Perianthium* igitur a latere compressum fit, forma sæpe compresso-campanulatum, vel longius et obconico-cylindraceum vel clavatum, paulo incurvum, ore lato plus minus obliquo, truncato, rotundato, vel bilabiato, ad bractearum instar armato; suturis exceptis, ubique leptoderme. Fructu crescente (vel antea) basi turgidum, subinde

obtuse quadrangulum, solum apice compressum evenit; plicis autem (nisi irregularibus in *Pl. bursata* et 2 vel 3 aliis) constanter orbatum. Foliolum florale posticum angustum interdum adest, vel tanquam ala interna intra perianthium adnata, vel utraque valvula margine connata, ita ut faciem perianthio tertiam suppetit, ad *Lophocoleæ* instar. *Calyptra* a perianthio libera, duplo vel perpaulo brevior, globosa vel ovali-globosa, leptodermis præter ad basin ubi in collum breve carnosum, basi pistillidiis sterilibus circumdatum, persæpe constricta. *Pedicellus* validus, sub 10 cellulas diametro, ad maturitatem in omnibus fere brevis, perianthio subduplo longior; in *Pl. asplenioide* et perpaucis aliis elongatus, subpollicaris. *Capsula* sat magna, globosa vel ovali-globosa, pachydermis, ad basin usque 4-valvis, valvulis haud raro bilobis; paries e cellulis 3–8-stratis, quarum extimis duplo majoribus cubicis, columnis angularibus fulcitis; interioribus tenuibus opacis fibra semiannulari (interdum ex p. obsoleta) farctis. *Elateres* dispiri; inveniuntur etiam (in capsulæ apice præcipue) ex parte vel tota longitudine monospiri. *Sporæ* parvæ minutæve sublævissime.

Hab. et Distr. Plantæ præ aliis omnibus hepaticis sylvaticæ, inter tropicos et in zona temperata australi frequentes, in boreali rariores. In zonis temperatis rupicolæ et terricolæ, in sylvis Amazonicis autem et Andinis semper fere arboricolæ, vel in truncis ramisque vivis, vel in prostratis putrescentibus vigentes; dum paucæ species ad rupes, vel in ipsa terra inveniuntur. De sua distributione speciali expositionem pleniorem sub sectionibus proxime describendis inveneris.

The species of this fine genus are notable for the presence of a stout creeping trunk, or caudex, densely radicellose on the underside, while the leafy stems that arise from it are, as a rule, quite rootless, except sometimes at the very base. The caudex itself puts forth distant leaves, only one-third the size of the stem-leaves, attached by a broad base—decurrent on the upper side of the stem at an angle of 45°, on the underside shortly and narrowly arched—and sometimes reduced to a semilunate rim, but more commonly subquadrate, truncate or retuse, in some species rounded, and either toothed or entire. In age they usually decay long before the rest of the plant; but sometimes a few such leaves extend also some way up the assurgent stems, giving the latter a tree-like aspect, and these are more permanent. The caudex is often subramose, in the same plane, some of the branches being occasionally rooting flagella. In the § *Heteromallæ* the erect stems put forth similar rooting stolons towards the base; and sometimes leafless—or deciduously leafy—but rarely rooting stolons up to the very top; but in all the other sections such stolons are very rarely present.

The absence of rootlets from the stems and branches, although at first sight a constant character, is yet not without exceptions. *Pl. tenuis* Lindenb., in fertile specimens from Guadaloupe which I owe to the

kindness of M. Husnot, is constantly radicellose. The branches tend to become geniculate, and at the geniculations shortish pale radicles are developed, sometimes extending nearly to the apex of the branch. The Javan *Pl. abietina* N. puts forth radicles on the decurved attenuated apex of certain branches; so does the Nepalian *Pl. semidecurrens* L. et L. In a few species where the ascending apex of the caudex passes insensibly into a stem, the radicles may be continued a long way up the latter. In the European *Pl. interrupta* I find a prostrate stem, radicellose and small-leaved at the base, for a short distance, then slightly assurgent and branched, with the branches usually bare of radicles except when the decurving apices bring them into contact with the matrix, when they may emit a tuft of radicles. The feature is not more marked than in *Pl. tenuis;* and if, along with the monoicous inflorescence and the somewhat flatter leaves, it be held sufficient to separate the species from normal *Plagiochila*, it can only be as a subgenus (*Pedinophyllum* Lindberg), but never as a member of the verticillate-leaved *Leioscyphus*, with which some authors have united it.

Some plants, however, with distinctly rooting stems, which have been described as Plagiochilæ, are plainly members of other genera. *Pl. laxa* L. et Lindn. Sp. Hep. t. 18, which I have gathered with ♀ flowers in the Andes, is a *Tylimanthus*, allied to *T. saccatus* (Hook. Musc. Exot. t. 6) Mitt.—To the same genus possibly belong *Pl. amplexifolia* Hpe. and *Pl. comata*, N., known only in a barren state—*Pl. variegata* Lindenb. Sp. Hep. t. 33, is a species of *Syzygiella* (nob. in Journ. Bot. 1876), allied to *S. perfoliata* (Sw.).*

The branches of *Plagiochilæ* are uniformly lateral, springing from the leaf-axils, usually towards their postical angle, but sometimes (especially in the pinnately-branched species) adjacent to the middle of their base.

Gemmæ are rarely produced on the leaves of *Plagiochilæ* in the Amazonian plain and the slopes of the Andes, where there is almost perennial moisture; but when trees and shrubs are cut down for a new plantation, and are allowed to lie until dry enough to be burnt, the mosses on their trunks and branches—no longer protected from the sun's scorching rays by a leafy canopy—begin to shrivel up. Then the leaves of the *Plagiochilæ* disintegrate at the margin; the loosened cells hang awhile in little masses, then fall away and are dispersed—some to renew their growth as distinct individuals.

The marginal teeth or cilia, which are so marked a feature of the large leaves of *Plagiochilæ*, are uniformly acute, ending in a single sharp-pointed conical cell; and whenever a blunt tooth is seen it indicates either malformation or disease: the latter often induced by unwonted drought, or abstraction of essential shade, such as I have just described. Thus I am pretty certain that the figure of *Pl. surinamensis* Sande-Lac., in Hep. Jav. Suppl. t. 20, has been made from a plant picked off a fallen tree in some new clearing in Dutch Guiana, which is indicated by the ragged edge and broken teeth of the leaves, such as exist in the perfect state of no *Plagiochila*.

Propagula, in the shape of leaf-suckers—minute branchlets springing from the surface of the leaves, and each based on a single cellule—are frequent enough, and indicate a degree of moisture sufficient to check

* Two Javan species, *Pl. costata* N. Sp. Hep. t. 26, and *Pl. ciliolata* N. l. c. t. 30, with large connate ovate ciliated underleaves and trialate perianths, are plainly nearer *Lophocolea* than *Plagiochila*, and should probably constitute the type of a new genus.

fertilisation and maintain the plants in perpetual sterility. The leaf-suckers empty the cell from which they arise, and often several adjacent cells, of chlorophyl. When the parent leaf is entirely decayed, the suckers that survive start off on a separate existence, and speedily assume the normal foliage of the species. Lining the roof of a cavern at the foot of the volcano Tunguragua I found a matted growth of leaf-suckers, bearing minute bifid or trifid leaves, and differing greatly from those of the parent plant, which is what I have called *Pl. hypantra* n. sp. *Pl. macrifolia* Tayl., in the Cinchona forests on the western slope of Chimborazo, and several other species occasionally put forth leaf-suckers. Nor is it only in the genus *Plagiochila* that these structures exist. Forty years ago, in the "Phytologist" for February, 1845 (vol. ii. p. 85), I described and figured the way *Herberta adunca* (Dicks.)—then called, but incorrectly, *Jung. juniperina* Sw.—puts forth minute adventitious ramuli from the surface of its leaves; and I have since then noted them in nearly every genus of hepaticæ, even in *Lejeunea* and *Frullania*. To whatever genus the mother-plant belongs, the leaf-suckers have always minute bifid leaves, so like those of a *Cephalozia* or *Jungermania*, that I suspect several supposed "species" of *Jungermania*, described in books from sterile *frustula*, found "intermixed with" or "growing upon" other and larger species, to be in reality mere leaf-suckers of those species.

The characters of *Plagiochila* are so marked and peculiar that the genus cannot be confounded with any other. The perianth of *Leioscyphus* is similarly flattened at the sides, and truncate at the apex, but the opposite leaves are always connate with the large intervening underleaves, whereas the opposite-leaved *Plagiochilæ* never have any underleaves, those organs being confined to a few of the alternate-leaved species. Moreover the procumbent stems of *Leioscyphus* are always conspicuously radicellose, and the branches are distinctly postical, axillary to the underleaves.—In the very rare cases where the perianth of *Plagiochila* becomes trigonous, by the addition of a narrow postical face, there are always the radicellose stem of *Lophocolea*, the large and conspicuous underleaves, the tristichous involucres of large bifid bracts, and the 3- or 6-lobed mouth of the perianth to distinguish the latter genus.

The arrangement of species propounded by Lindenberg in his admirable monograph I have found in practice so intractable that I here propose another, which I hope may be found easier to work with, and more conformable to nature. With the full description of the genus I have already given, and the characters of the sections to follow, the student will need no further explanation. Besides the five sections here specified, a sixth (of which I found no example in my American travel) would be needed to contain a few species, including our *Pl. asplenioides*, the New-Zealand *Pl. gigantea*, and some others, which have large alternate leaves, long tubular perianths, and above all an elongated pedicel, sometimes exceeding an inch, whereas in all the other sections the pedicel is shortened down to at most twice the length of the perianth.

Divisio I. *CAULIFLORÆ.*

Caules e caudice prostrato assurgentes, erecti pendulive, ♀ vulgo innovando-ramosi et vix aliter divisi, sc. apice florentes et e foliorum involucralium axillis innovationem hinc vel utrinque proferentes, innovationibus vel simplicibus vel denuo (sæpe iteratim) innovandis.

§ 1. SPINULOSÆ.

Species pleræque statura aspectuque nostrati *Pl. spinulosæ* comparabiles, pancæ pusillæ, perpancæ subrobustæ, colore e viridi rufescente vel rufobadio. *Folia* in omnibus fere alterna, in perpaucis subopposita; aut distiche patula aut (etiam in una et eadem specie) recurvo-secunda; in plurimis sat elongata et subdimidiata, 2–4plo longiora quam lata, raro latiora; basi ad speciem subcuneata nunquam recurvo-cristata; margine pro more dentato-spinulosa, rarissime ciliata; *cellulæ* plerumque mediocres, in aliis speciebus oblongæ linearesve. *Foliola* adhuc solum in unica specie (*Pl. bursata*) observata. *Perianthia* in plerisque duplo—in paucis 3–4plo—longiora quam lata, rarius alata, ore spinosa raro ciliata. *Andræcia* in ramis media terminaliave; bracteis sæpe plurijugis in aliis speciebus parvis 1–2-andris, in aliis majoribus ad 6-andris.

Hab. In sylvis planitiei Amazonici et in Andium radicibus pleræque species ubique fere sat vulgares super truncos prostratos putrescentesque in latas plagas se extendunt, vel ad ramulos vivos muscis immixtæ crescunt; aliæ multo rariores ad rupes et arborum truncos in Andium media regione sylvatica inveniuntur.

Obs. All the species of this section are liable to exchange their green for a reddish-brown hue, even when growing, and the latter pervades them when dried. The rufous perianth is an almost constant feature. A pure roseate colour I have not observed in any species. The fine *Pl. bursata* is notable for its metallic lustre, golden on the eastern, coppery on the western side of the Andes; as also for its narrow dicranoid leaves and their linear (almost hypnoid) cells, and for the many-leaved capituliform involucres.

A. *Involucratæ. Bracteæ* ♀ 1–4 *jugæ, perianthii basin amplectentes.*

1. *Pl. bursata.* Caules tenues longissimi innovando-elongati, vix aliter ramosi. F. nitida subdissita squarrosa, prælonga et angusta, scalpelliformia, apice acuminato bifida vel 3–4-spina, cellulis linearibus. Br. 2–4-jugæ ovatæ confertæ, toto margine subspinosæ. Per. vix emersa clavato-campanulata turgida subplicata, ore compresso spinosa.
2. *Pl. Tunguraguensis.* Elata, iteratim innovata, plerumque monotropa. F. subimbricata, patula vel secunda, semiovata, apice subacuto 3–5-dentata, cellulis inferioribus elongatis, superioribus magis æquilateris. Br. 3-jugæ, rude subspinosæ, foliis majores subconformes. Per. vix emersa, late campanulata, antice subalata, ore compresso spinosa.
3. *Pl. rutilans.* Tenuis subinnovata, cæterum vix ramosa. F. subimbricata semiovata, basi antica valide recurva longe decurrentia, margine postico supra medium apiceque rotundato longispinulosa.—Var. ? *æquatorialis.* Elongata, interdum ramulis microphyllis efloriferis pinnulata. F. apice 2–5-fida-spinosave, cæterum subintegerrima. Per. ore subrecte truncato spinosa.
4. *Pl. hypantra.* Filiformis vage ramosa, interdum subpinnata. F. imbricata patula oblique oblonga, margine postico apicem versus apiceque 2–6-dentata; ramulina truncato-bidentata.
5. *Pl. Negrensis.* Pusilla, iteratim innovanda, sæpius dichotoma. F. dissita ligulato-oblonga, apice subtruncato argute 4-spinosa; c. mediocres. Br. adpressæ circumcirca spinoso-dentatæ. Per. subemersa, obovato-campanulata exalata, ore rotundato longiciliata.

6. *Pl. Chinantlana.* Priori major. F. subopposita subdissita, sæpius secunda, semiovalia, margine basali utrinque valide recurvo, antico sub apice, postico ab ipsa fere basi spinoso-dentata, apice lunato-bispinosa, spinis omnibus 20–27. Per. obovato-campanulata, anguste alata, ore compresso bilabiato spinoso-ciliata. Br. ♂ hexandræ.
7. *Pl. distinctifolia.* Robustior, vage vel dichotome ramosa. F. subdissita patula et secunda semiovato-oblonga, e margine basali utrinque recurvo ad speciem cuneato-obovata, margine postico toto fere, antico sub apice, 18–25-spinulosa. Per. oblonga exalata, ore compresso bilabiato-ciliata. Br. ♂ monandræ.

B. *Exinvolucratæ. Perianthium basi nudum, bracteis propriis nullis.*

* *Folia opposita.*

8. *Pl. oresitropha.* Robustiuscula, sæpius iteratim innovanda. F. densa secunda, prælate semiovata cordatave, margine antico revoluto subdenticulata, postico (basi excepta) crebre spinulosa, d. omnibus 36–40, c. fere majusculis. Per. oblonga exalata, ore compresso truncato ciliata.
9. *Pl. sylvicultrix.* Caules parum ramosi. F. densa sæpius secunda, semiovato-orbiculata, tam lata quam longa, margine antico sub apice, postico toto (basi excepta) argute spinoso-denticulata, d. sub 18, cellulis parvulis.

** *Folia alterna.*

10. *Pl. simplex.* Pusilla, caudice late repente multicauli. Caules simplices, furcati, vel superne fasciculato-ramosi. F. subsecunda late semiovata rotundata, margine utrinque basi valide recurvo, antice sub apice denticulata, postice a basi fere spinulosa, d. 16–22. Br. circumcirca crebre spinulosæ, pro m. dissitæ. Per. obovata, basi tetragona, ore compresso bilabiato crebre spinuloso-ciliata.
11. *Pl. gymnocalycina.* Elatiuscula monotrope innovanda. F. imbricata vel subdissita, late semiovata rotundata, margine antico sub apice, postico toto fere argute 10–12-(vel pluri-) spinosa. Per. anguste pyriformia exalata, inferne tetragona, apice compresso subbilabiato longispina.—Var. ? *ciliato-dentata.* Major, fol. dentibus ciliiformibus.
12. *Pl. chimborazensis.* Robusta, ramis longis arcuatis. F. subsecunda imbricata, late semiovata sensim subacuminata, margine antico infra apicem, postico toto (basi excepta) spinuloso-denticulata, d. 12–24, aliis ciliiformibus. Per. obconico-obovata, anguste semialata, ore compresso truncato ciliata.
13. *Pl. macrifolia.* Tenuis, vage divisa vel dichotoma, interdum fasciculato-ramosa. F. dissita angusta semiovato-lanceolata obtusa acutave, in var^{s}. linearia, apice et margine postico breviter spinoso-dentata, d. 9–13, interdum ad 2 apicales solos redactis. Per. prælonga et angusta, clavata, exalata, ore compresso subconstricto rotundato spinoso-ciliata.
14. *Pl. aerea.* Tenuissima, monotrope innovanda. F. dissita patula, lanceolato-linearive-oblonga, acuta, antice subintegerrima, postice a basi fere longispina, spinis sub 8, apicalibus prælongis. Per. parva oblonga tetragona, ore compresso longispina.

§ 2. GRANDIFOLIÆ.

Caules e caudice prostrato erecti pendulive, inferne simplices vel vage

subdivisi, apice florente innovandi, sæpe dichotomi, haud raro ex involucro innovationes 2–6-natas distiche proferentes, ex eo fasciculato-dendroideove-ramosi; rami eodem modo innovandi vel simplices. *Folia* magna, 4–7^{mm} longa, sat lata, in vivo sæpius amœne viridia, siccando pallida, flavida badiave, neque rufa nec rosea; in speciebus Andinis semper *opposita*, vel saltem per paria approximata, basi postica latæ plerumque semicordata, auriculâ vel recurvo-cristatâ vel appressâ, caulem et folia contraria imbricante, margine utplurimum longe ciliata spinosave, raro solum denticulata, rarissime integerrima; *cellulæ* majusculæ, in paucis mediocres, rarissime parvulæ. *Foliola* constanter nulla. *Perianthia* semper bracteis involucrata, plerumque insigniter alata. *Androecia* in plerisque speciebus terminalia, composita, eleganter flabellatim dichotoma, ramis tenuibus ubique bracteiferis, bracteis minutis monandris; in perpaucis ad plantæ ab initio dichotomæ ramos apicalia medianave, spicam fusiformem sistentia, bracteis majoribus polyandris (antheridiis ad 10).

Hab. Plantæ in genere nobilissimæ, foliis ad quartam pollicis vel etiam ad tertiam partem attingentibus, sæpe pulcherrime ciliatis, Andes sylvaticos habitant, majore copia in regione temperata, inter 1500 et 2800 metr. altitudine, adusque 3400 metra tamen ascendunt; unica specie excepta, secus fluminis Orinoco origines inventa, in planitiem nusquam descendunt. Loca umbrosissima diligunt, ubi ad arborum truncos ramulosque, necnon sed rarius ad rupes, rarissime sub fruticibus in ipsa terra vigent.

Obs. These fine plants present much uniformity of coloration, being when fresh usually of a pleasant green, verging on the one hand to yellow, on the other to olive, and are never (not even when dried) either rose, or red-brown, or golden; although *Pl. conspicua* approaches the latter tint.

A. *F. circumcirca dentata, spinosa, ciliatave, vel solum in ipsa basi integerrima.*

15. *Pl. procera.* Elata densifolia. F. maxima opaca semicordato-ovata rotundata, crebre ciliolata, auricula basali recurva caulem longe superante. Per. immersa campanulata compressa spinoso-alata, ore bilabiato crebre spinoso-ciliata. Br. ♂ 8–10-andræ, sub 10-jugæ, rami medio apiceve posita.
16. *Pl. Pichinchensis.* Elata parce dichotoma. F. maxima subpellucida conferta subquarrose patula, late semicordato-ovata, anguste obtusa, basin versus utrinque integerrima, cætero margine dentato-ciliata, ciliis haud numerosis (20–25), 3–10 c. longis, tortellis. Per. immersa oblongo-orbiculata bilabiata, labiis semiorbiculatis prælonge pauci-ciliatis, hinc latissime alata.
17. *Pl. eximia.* Elata gracilis flaccida, infra fl. ♀ terminalem (innovandum) sat ramosa. F. magna semicordato-ovato-oblonga, auricula minore appressa, margine toto crebre spinoso-ciliata, ciliis 4–8 cell. longis, cilio auriculari ad 12 c. longo. Per. immersa campanulata exalata, ore bilabiato ciliata.
18. *Pl. conspicua.* Elatiuscula densifolia, inferne subramosa, apice subdivergenti-dichotoma. F. magna semiovato-triangularia, basi subsemicordata, basi ipsa excepta ubique argute dentato-ciliata, ciliis haud numerosis 6–8 c. longis; cellulæ mediæ majusculæ. Per. vix emersa

obovato-campanulata, ore compresso subconvexo longissime ciliata, hinc vel utrinque latissime ciliato-alata.

19. *Pl. notilophila.* Humilis, simplex vel semel innovata. F. mediocria semiovato-oblonga subtruncata, circumcirca crebre spinoso-ciliolata, spinis 3–6 c. longis ; c. mediocres. Per. immersa campanulata compressa, ore obliquo spinosissima.
20. *Pl. adiantoides.* Mediocris, ex innovationibus iteratim dichotoma vel fasciculato-ramosa. F. sat magna subimbricata semiovato-oblonga, basi subsemicordata appressa, basi excepta circumcirca longispina, spinis sub 30; c. majusculæ. Per. maxima clavato-oblonga compressa, anguste alata, ore bilabiato crebre longissime ciliata.
21. *P. virens.* Humilis tenella, semel bisve furcata. F. magna imbric. prælate semiovata rotundata, toto margine (antico medio excepto) spinulosa, d. 40–44, parvis; c. majusculæ. Per. parum emersa, campanulata, ore bilabiata crebre (haud longe) ciliata.
22. *Pl. leptophylla.* Mediocris, innovando-dichotoma, innovationibus sæpe fasciculatis, ultimis aspergilliformibus. F. mediocria tenuia prælate semiovata rotundato-truncata, basin versus integerrima, cætero margine spinuloso-dentata, spinulis inæquilongis, apicalibus subulato-setaceis. Br. circumcirca laciniato-ciliatæ, ciliis ad 16 c. longis. Andr. flabellatim dichotoma, br. monandris.
23. *Pl. Pacimonensis.* Mediocris, caule (plantæ ♂) apice flabellatim dichotomo. F. mediocria semiovato-oblonga rotundato-truncata, margine (basin versus excepto) argute dentata, d. sub 28 late subulatis 3–6 c. longis, basi 2–6 c. latis. Br. ♂ monandræ.

B. *F. margine antico subintegerrima, postico apiceque pro m. armata.*

24. *Pl. cultrifolia.* Elata, caule supra medium iteratim 2-3-chotomo. F. magna tenera parum imbricata semiovato-triangularia, e basi antica longissime decurrente cultriformia, margine postico valide dentato-spinosa, spinis sub 20, ad 6mm longis. Per. emersa oblonga compressa alata, ore bilabiato longiciliata.
25. *Pl. macrotricha.* Elatiuscula iteratim dichotoma. F. maxima subimbricata semiovato-oblonga subfalcata, margine postico apiceque spinis dissitis prælongis—aliis ad 10 c. longis—superne capillaceis armata. Per. emersa obconico-campanulata alata, ore bilabiato longissime ciliata.
26. *Pl. ensiformis.* Elata subsimplex (sterilis). F. mediocria imbricata subsemicordato-ensiformia, duplo fere longiora quam lata, margine postico (auricula appressa excepta) dentato-spinulosa, d. omnibus ad 20, plerisque parvis, folii apicis truncati autem 3 v. 4 majoribus spiniformibus.
27. *Pl. Notarisii.* Robusta dichotoma vel fasciculatim innovata. F. maxima tenuia imbricata subplana, latissime semicordato-triangularia obtusata, dimidio supero spinuloso-dentata, d. 8–12. Per. emersa laxe bracteata, late campanulata, ore subtruncato longiciliata, prælate alata.
28. *Pl. Jamesoni.* Elata subdichotoma. F. magna tenuia imbricata, distiche patula vel secunda, subsemicordato-ovato-oblonga, apice prælato rotundato spinulosa repandave, cætero margine subintegerrima. Per. subemersa late oblique campanulata, ore compresso alte bilabiato minute crebre spinulosa, antice late alata.
29. *Pl. zygophylla.* Mediocris dissitifolia subramosa, vix unquam sub flore ♀ terminali innovata, stolones autem aspergilliformes ex in-

volucro interdum proferens. F. parvula subhorizontalia, per paria breviter connata, late semiovata, apice anguste truncato 0–3-dentata. Per. emersa oblonga, ore compresso subobliquo truncato crebre setosa, utrinque alata.

30. *Pl. fuscolutea.* Elata, sterilis sæpe simplex, fertilis autem sub flore furcata. F. parvula conferta latissime ovata, basi postica valde recurvo-cristata, apice rotundata, truncata, retusa vel exciso-bidentata, cætero margine subintegerrima. Per. subemersa, late cupulato-campanulata, compressa exalata, ore subobliquo undulato-truncato integerrima.

§ 3. HETEROMALLÆ.

Caules innovando-dichotomi (in unica specie pinnati) ramique apice plus minus circinati; in aliis stolones flagelliformes prope basin, vel secus totam caulis longitudinem edentes. *Folia* etiam in vivo raro viridia, utplurimum fulva, rufo-badia vel nigricantia, imbricata, sæpe conferta, recurvo-secunda, rarius fere plano-disticha, alterna, raro per paria approximata, in prima cohorte ciliata, in secunda inciso-spinosa; *cellulæ* subæquilateræ, in diversis speciebus magnitudine valde diversæ. *Foliola* caulina nulla, in perianthiis autem interdum apparent cristulæ 2 vel 3 posticæ, foliolum florale, simplex vel bifidum, sistentes; cujus exempla habemus in *Pl. oxyphylla et homochroma.* *Perianthia* plerumque campanulata, minus frequenter bilabiata quam in *Grandifoliis.* *Andræcia* in ramis media terminaliave, anguste fusiformia, bracteis pro m. 1–2-andris.

Hab. Plagiochilæ quæ caracteribus supra expositis inter se congruunt, in cohortes duas se dividunt. Prior species complectitur quæ foliis haud raro explanatis—nec constanter secundis—basi sæpe semicordatis, ad *Grandifolias* accedunt. Hæ omnes in regione Andium sylvatica superiore habitant, inter 2000 et 2800 metra alt. præcipue, nec usquam infra 1500^{m} meipso visæ fuerunt. Species secundæ cohortis usque ad 1200^{m} descendunt et tam alte quam priores super montes ascendunt. Foliis valide recurvis, ad speciem rigidis, profunde incisis, colore lurido sæpe in nigrum vergente, a cæteris congeneribus facile distinctæ; caulibus apice insigniter circinatis *Jamesoniam* (inter filices) in mentem referentes. *Heteromallæ* omnes minus raro quam cæteræ congeneres in ipsa terra vigent, sub fruticum, Ericearum præcipue, umbra et inter folia emortua, sociis *Jungermaniis, Lophocoleis* et *Polypodiis* florentes.

A. *Folia in una et eadem specie nunc decurvo-secunda nunc plano-disticha, margine ciliata denticulatave.*

31. *Pl. heteromalla.* Robusta subdichotoma. F. majuscula imbricata late semicordata rotundata, circumcirca fere spinulosa, spinulis sub 40, basi postica lata recurvo-cristata. Per. maxima oblongo-ovalia, ore compresso bilabiata, labiis crebre spinoso-dentatis, antice subalata.—Var. *latifolia.* F. suborbiculata, antice dimidio infero integerrima, basi postica appressa. Per. ore longispina, spinis subramosis.—Var. *densifolia.* F. prælate semicordata, margine antico subrecta, basi postica recurva. Per. obovata.

32. *Pl. pachyloma.* Mediocris subinnovata, ramis apice circinatis. F. conferta patula et secunda cordiformia rotundata, margine antico parum rotundato rufo-marginato integerrima, postico semiorbiculari longe rufociliata, cellulis parvis. Per. emersa rufa late campanulata compressa ciliato-alata, ore rotundato-truncato inciso-ciliata. —Var. *elatior,* ramis substrictis, foliis pallidis concoloribus.

33. *Pl. oxyphylla.* Mediocris di-et tri-chotoma, ramis substrictis. F. subimbricata patula subconcoloria, semicordato-ovata apice spinoso-acuminata, margine antico recto integerrima, postico dentato-ciliata; c. mediocres. Per. vix emersa albida subcupularia, ore compresso rotundato crebre dentato-laciniata, antice spinoso-alata, postice bicristulata.
34. *Pl. permista.* Mediocris simplex vel inferne pinnulata. F. laxe imbricata patula vel secunda late semicordato-triangularia obtusata, margine antico integerrima, postico distanter subspinulosa; c. parvulæ. Per. subemersa a basi cuneata oblonga compressa exalata, ore truncato spinulosa.
35. *Pl. increscentifolia.* Humilis simplex vel semel innovando-furcata. F. conferta accumbentia devexa, basalia minuta, superiora sensim increscentia in bracteas majusculas transeuntia, oblique orbiculata, margine antico revoluto subintegerrima, postico inciso-dentata, dentibus spinoso-acuminatis retrorsis. Per. maxima emersa campanulata compressa subalata, ore truncato profunde incisa.
36. *Pl. homochroma.* Mediocris, ramis iteratim dichotomis vel fasciculatis laxifoliis, basi parvifolia. F. superiora sat magna *opposita*, semicordato-orbiculata, basi excepta, circumcirca dentato-ciliolata. Per. (juv.) cuneata bilabiata, labiis ciliatis.
37. *Pl. calomelanos.* Elata debilis subsimplex nigrescens. F. maxima alterna semicordato-ovato-orbiculata, circumcirca fere crebre minute ciliata; c. mediæ majusculæ, submarginales multo minores opaciores. Per. . . .

B. *Folia semper valide decurvo-secunda, pro more inciso-spinosa.*

38. *Pl. stolonifera.* Elatiuscula subdichotoma vel fasciculata, stolones subaphyllos solitarios vel fasciculatos hic illic proferens. F. subimbricata late semicordato-ovata, margine antico subrevoluto integerrima, postico spinulosa ciliatave, spinulis sub 10, cellulis parvulis. Per. late campanulata subspinoso-alata, ore compresso subconvexo spinis circ. 20 armato.
39. *Pl. filicaulis.* Tenuissima iteratim dichotoma subfastigiata. F. parva dissita decurvula late semiovata rotundata, margine antico subintegerrima, postico inciso-dentata, d. 6–10, c. mediocribus subopacis. Br. majores appressæ margine toto fere longidentatæ. Per. campanulata, ore profunde inciso-spinosa.
40. *Pl. compressula.* Mediocris iteratim dichotoma, basi flagellifera, apicibus insigniter circinatis. F. parvula subconferta patulo-recurva, cuneato-semiobovata, margine antico recurvo integerrima longissime decurrentia, postico profunde inciso-spinosa, spinis 7–12, duabus apicalibus prælongis, c. parvis. Br. majores late semicordatæ, ubique spinosæ. Per. emersa, cuneato-companulata compressa exalata, ore lato rotundato multispina.
41. *Pl. centrifuga.* Subpusilla, simplex bifidave, hic illic flagellifera. F. conferta, e basi erecta recurvo-secunda, ovato-orbiculata, margine antico valide recurvo integerrima, postico 4–10-spinulosa, apice bispinosa; c. parvulæ. Br. multo majores plurispinæ. Per. emersa late campanulata compressa alata, ore rotundato-truncato crebre spinosa.
42. *Pl. fragilis.* Elatior, iteratim dichotoma, ramis fastigiatis. F. majuscula fragillima densissima secunda late semiovata, margine antico subrevoluto apice bidentata, postico toto spinosa, spinis sub 16; c. parvulæ. Per. alte emersa campanulata exalata, ore compresso crebre spinosa.

43. *Pl. pinnata.* Mediocris pinnata rigidiuscula. F. parva fragillima conferta, e basi erecta recurvo-secunda, oblique orbiculata, margine postico apiceque dissite spinosa, spinis sub 10; c. parvæ opacæ, inferiores laxiores pellucidæ. Per. campanulata, ore laciniata.

Divisio II. *RAMIFLORÆ.*

Caules vel iteratim dichotomi vel ex parte dichotomi ex parte pinnatim ramosi, raro ab initio 1–3-pinnati; flores ♀ in ultimis ramulis—rarius etiam in ultimis axillis—terminales; itaque plantæ bene evolutæ frondem flabelliformem, ambitu florentem, persæpe simulant.

§ 4. FRONDESCENTES.

Caules e caudice in arborum ramulis radicibusque, vel in saxis, longe repente erecti horizontalesve; rami penduli, in planum ramosi, vel pinnatim ramosi vel dichotomi. Folia majuscula (2·5–4·5^{mm} longa) viridia flavida roseave, in unica specie insigniter glauca, alterna, haud valde conferta vel etiam dissita, raro basi cordata vel in cristam recurva; cellulæ pro more majusculæ mediocresve ($\frac{1}{16}$–$\frac{1}{10}$^{mm}).

Hab. Species omnes Americæ Æquinoctialis vel ripariæ vel locorum impluviatorum diligentes; quarum 3 in planitie Amazonica, 2 in Andibus inferioribus, 4 denique in Andibus sylvaticis superioribus legi.

A. *Pinnatæ. Ramificatio pinnata, subinde decomposita, ramulis ultimis rarius furcatis.*

44. *Pl. amazonica.* Late repens pinnata, colore sæpe pulchre roseo. F. magna vix imbricata tenuia, prælate semiovato-oblonga, truncata, basi plerumque semicordata recurva, toto margine longiciliata, ciliis ad 40. Rami ♀ pro m. simplices. Br. margine antico replicatæ, inciso-ciliatæ. Per. alte emersa, e basi cuneata lineari-oblonga compressa exalata, ore truncato crebre ciliata. Var.? *parvifolia.* F. magis dissita, inferne utrinque subintegerrima.

45. *Pl. lætevirens.* Late repens bipinnata virens. F. mediocria, imbricata late semiovata vel semicircularia, margine basi utrinque valide recurvo, antico sub apice (rotundato)—postico toto—spinulosa, spinulis 10–12. Per. subemersa cuneato-campanulata, alata, basi turgida, ore compressa spinosa.—Var. *Peruviana.* Rufescens, foliis subdissitis siccando lineari-constrictis.

46. *Pl. impluviata.* Elata, flabellatim subpinnata. F. mediocria late semiovata, margine antico longe decurrente integerrima, postico (basi caulem amplexante excepta) apiceque breviter spinulosa, spinulis sub 12. Per. emersa prælate campanulata late alata, basi subinflata, ore lato compressa crebre spinosa.

47. *Pl. montana.* Elata semel—ter pinnata. F. mediocria imbricata tenuia semicordato-ovata rotundata, margine antico longe decurrente supra medium denticulata, postico (basi subrecurva excepta) apiceque spinulosa, d. omnibus sub 20. Per. alte emersa obovato-campanulata, late alata, ore lato compresso subrotundato breviuscule spinosa.

48. *Pl. flabellifrons.* Elata pendula, pinnata vel decomposita. F. caulina maxima, ramea sensim minora, imbricata tenuia latissime semicordata rotundata, margine antico longe decurrente integerrima, postico apiceque spinulosa, spinulis sub 15, auricula basali semicirculari caulem late transeunte. Per. . . . . .

B. *Caules ab initio dichotomi, solum in* Pl. dichotoma *ex parte pinnati.*

49. *Pl. longispina.* Elata glauco-viridis tenerrima, iteratim acute dichotoma. F. subimbricata subplana ovato-orbiculata circumcirca crebre longiciliata, ciliis ad 16 cell. longis. F^{la} parva irregulariter plurifida. Per. maxima cupulari-campanulata, valde oblata, basi inflata, ore rotundato compressa laciniato-ciliata.

50. *Pl. diversifolia.* Elata pallide virens iteratim subrecte dichotoma. F. subdissita tenuia subconvexa semiovata, apice subtruncato 4-spina, margine antico subintegerrima, postico 5–9-ciliata. Ramuli ♀ simplices clavati. Per. late spathulata, alte bilabiata, labiis laciniatis.

51. *Pl. xanthochroma.* Tenuis flavida iteratim rectangulo-dichotoma. F. imbricata falcato-semiovata, 2–3plo longiora quam lata, recurvo-canaliculata (in sicco convoluta), apice subtruncato paucispina, margine postico distanter dentato-serrata, d. omnibus 10–12.

52. *Pl. dichotoma.* Mediocris flabellatim dichotoma vel ex p. pinnata. F. in sicco sublurida dissita, obovato-oblonga, apice rotundato—raro etiam margine postico supra medium—subspinulosa, d. 8–16. Per. oblongo-campanulata, alata, ore compresso bilabiato spinosa.—Var. *patentissima*, robustior, foliis minus dentatis, per. exalatis.—Var. (?) *fluitans*, caule interdum pedali, iteratim acute dichotomo. F. imbricata subrhomboidea integerrima vel solum repanda.—Var. *rivicola*, mascula, laxe pinnata, foliis oblongis apice paucidenticulatis.

§ 5. CRISTATÆ.

Plantæ pusillæ vel mediocres, in vivo virentes aureæve, rarissime roseæ, depresso-cæspitosæ, sæpe ultra matricem (fruticis ramulum) utrinque horizontaliter patulæ. *Caules* e caudice repente in plerisque iteratim dichotomi, in paucis ex parte—raro ab initio—pinnatim ramosi, ubique densi-æquifoliati, ambitu sæpe ditissime floriferi. *Folia* 2–3^{mm} (solum in duabus speciebus ad 4^{mm}) longa, subduplo longiora quam lata, *alterna*, confertissima, semper fere distiche patula, e basi semicordatâ valde recurvo-cristatâ superne sensim angustata (unde rami cum foliis pulchre pectinati eveniunt), margine plus minus dentato-spinosa, raro ciliata; *cellulæ* omnium fere parvulæ obscuræ, in *Pl. thyoide* et *bryopteroide* minores ($\frac{1}{18}$—$\frac{1}{36}$^{mm}). *Foliola* in aliis præsentia, pro m. minuta, plurifida, in aliis omnino nulla vel saltem adventitia. *Flores* ♀ in ramulis ultimis—rarius etiam in penultimis—terminales, innovatione suffulti vel persæpe non. *Bracteæ* 1–2-jugæ, raro 3–4-jugæ, appressæ, circumcirca armatæ. *Perianthia* obovato-vel oblongo-campanulata, ore laciniata vel longispina. *Andrœcia* simpliciter spicata, in ramis terminalia basilariave; antheridia 1–4-na.

Plagiochilæ § *Cristatæ* facie externa, ramis dichotomis pectinatim foliosis, et foliis angustis haud raro apice 2–3-dentatis *Bazzanias* haud male simulant, quamquam ab illis perianthii fabrica et præcipue foliis succubis longissime distant. *Grandifoliæ*, foliis basi sæpe recurvo-cristatis cum *Cristatis* congruentes, distinctæ sunt statura elatiore; caule primario apice florente, deinde dichotomo; foliis *oppositis*, duplo majoribus, sæpe prælatis, haud pectinatim concinnis, cellulis majoribus, etc.

Hab. In tota planitie Amazonica valde frequentes, in sylvis recentioribus (*caapoeira* in Brasilia, *rastrojo* in Venezuela dictis) præcipue, ubi ad arborum et fruticum ramulos, rarius ad truncos, rarissime ad ligna putrescentia vigent. In Andibus ad arbores et saxa multo rariores, nusquam

supra 1500^{m} alt. mihi obviæ fuerunt; ibidem scilicet *Grandifoliæ* regionem sylvaticam mediam et superiorem decorare incipiunt.

A. *Ramificatio ab initio dichotoma.*

* *Foliola præsentia.*

53. *Pl. lamellistipula.* Elatior parce divergenti-dichotoma, ramis longis arcuatis. F. semicordato-acinaciformia apice 3–6-spina, margine postico basi breviter 5–8-spina. F^{la} orbiculari-reniformia plurilaciniata, facie interna lamellis lanceolato-subulatis percursa. Per. obovato-cuneata, utrinque anguste alata, ore rotundato longispina.
54. *Pl. thysanotis.* Mediocris iteratim acute dichotoma, ramis strictis. F. semicordato-ovato-oblonga, apice truncato 4–5-spina, margine antico sub apice 1–2-dentata, postico spinuloso-serrata (nisi ad auriculam basalem ubi ciliata). F^{la} parva 4–5-partita. Br. 2–4-jugæ arcte imbricatæ undulatæ. Per. obovato-campanulata subalata, basi turgida, superne compressa et 4–6-plicata, ore subtruncato 40-spinosa.—Var. *megalostipa*, foliis magis dentatis, foliolis magnis reniformibus laciniato-ciliatis, ciliis 2 mediis longissimis.—Var. *fimbriata*, foliis angustioribus prælonge ciliato-spinosis, ciliis auriculæ creberrimis hamatis. F^{la} majuscula ovata profunde pluriciliata, ciliis mediis prælongis.
55. *Pl. fimbristipula.* Mediocris simplex bifidave. F. semicordato-ovato-oblonga subfalcata, margine antico integerrima, postico subcrispo superne spinoso-dentata, ad auriculam cristata, apice truncato 3–4-spina. F^{la} parvula oblata plurilaciniata, laciniis ad 15 ciliiformibus. Br. unijugæ. Per. campanulata compressa exalata, ore rotundato dentato-ciliata.
56. *Pl. hypnoides.* Mediocris dichotoma. F. patentia, in sicco sæpe devexo-secunda, semicordato-ovato-oblonga, apice subtruncato 4–5-dentata, margine antico sub apice paucidentata, postico breviter dentato-serrata, auricula distanter dentata vel subinermi. F^{la} parva semilunata plurifida. Br. bijugæ laxiusculæ, foliis paulo magis armatæ. Per. oblongo-campanulata peranguste alata inferne quadrangula, ore bilabiato compressa laciniis sub 60 brevibus armata.
57. *Pl. hortorum.* Pusilla tenera flabellatim dichotoma. A *Pl. hypnoide* differt etiam foliis margine minus argute serratis, ad auriculam minorem autem setoso-dentatis; foliolis vel persæpe nullis vel minutis ad basin usque in setas 6–8 partitis; perianthiis latius et spinuloso-alatis ore pluriciliatis.

** *Foliola nulla vel perrara.*

58. *Pl. florida.* Pusilla tenella pluries dichotoma, in ambitu florentissima. F. subimbricata patentissima semicordato-ovato-ligulata, truncata, margine antico infra apicem, postico toto apiceque argute spinosa, spinis 15–20, aliis brevibus aliis longioribus subulatis, ad auriculam tenuioribus. Br. bijugæ valde spinosæ. Per. campanulata exalata, inferne turgida, ore compressa spinis magnis paucis (sub 24) armata.
59. *Pl. venustula.* Pusilla iteratim acute dichotoma. F. imbricata semicordato-subscalpelliformia, margine antico sub apice obtuso, postico toto apiceque argute spinoso-dentata, d. sub 20, c. mediocribus. Br. 1–2-jugæ magnæ laxiusculæ. Per. campanulata late alata turgida, ore parum compresso crebre laciniata.

60. *Pl. rhizophila.* Elata fastigiatim dichotoma. F. confertissima semicordato-ovata obtusa, margine antico revoluto distanter denticulata, basi longe decurrentia, postico (auricula integerrima excepta) denticulata.
61. *Pl. disticha.* Mediocris dichotoma vel subsimplex. F. parum imbricata—siccando subdissita—semicordato-ovato-ligulata subfalcata apice truncato dentata, margine postico toto paucidenticulata ad auriculam subciliata. Per. (juvenilia) ore laciniata, laciniis paucis breviusculis.
62. *Pl. depressa.* Majuscula flaccida parum dichotoma. F. subplana imbricata semicordato-oblonga, apice rotundato-truncato dentato-spinosa, margine antico remote spinulosa basi longe arcuato-decurrentia, postico ciliata, ciliis 3–8 c. longis, ad auriculam crebris longioribus. F^{la} nulla vel rara, ad 3 crura filiformia redacta.
63. *Pl. hylacœtis.* Majuscula, caulibus simplicibus furcatisve densifoliis, sæpe utrinque attenuatis. F. pro more pulchre rosea semicordato-ovata, apice rotundato spinosa; margine antico revoluto basi longe decurrente ciliata, medio integerrima, apice subspinulosa: postico toto ciliata, ciliis ad auriculam creberrimis 10–12 c. longis, d. ciliisque omnibus sub 50.

B. *Ramificatio vaga, inter pinnatam et dichotomam ludens.*

64. *Pl. cristata.* Elata, ramis flexuosis vel incurvis sæpe apice flagellaribus. F. aurea anguste scalpelliformia, basi semicordata, apice sæpius bispinosa, margine antico subintegerrima, postico spinuloso-dentata, cellulis elongato-hexagonis.
65. *Pl. gymnotis.* Mediocris pellucida. F. imbricata semicordato-ovata, apice lato truncato 4-spinulosa, margine antico subintegerrima, postico dissite 3–5-spinulosa, auricula calva. F^{la} parva ad basin usque varie laciniata. Br. 2–3-jugæ appressæ.

C. *Ramificatio distincte pinnata.*

66. *Pl. pensilis.* Caules penduli prælongi semel bisve pinnati. F. densa semicordato-scalpelliformia, margine antico basi longissime decurrente minute 3-spinulosa cæterum integerrima, postico (ad auriculam præcipue) spinoso-ciliata. Br. prælatæ circumcirca crebre longispinæ. Per. compresso-poculiformia exalata, ore prælonge spinosa.
67. *Pl. oreocharis.* Elata flabellatim pinnata vel bipinnata. F. densa late semicordato-ovato-oblonga, margine antico longe decurrente subintegerrima, postico apiceque lato sparse denticulata. Br. unijugæ, latiores quam longæ, inciso-dentatæ. Per. campanulata tetragona exalata, ore lato bilabiato compressa spinosa.
68. *Pl. thyoides.* Elata arcte pinnata. F. conferta late semicordata obtusa, basi utrinque longissime decurrentia, superne spinuloso-denticulata, d. 6–12. F^{la} simplicia vel bi-tripartita, laciniis subulatis. Br. 2-jugæ, foliis longiores, postice crispæ et spinoso-denticulatæ. Per. campanulata spinuloso-alata, ore prælato longispina.
69. *Pl. bryopteroides.* Elatiuscula arcte bipinnata. F. conferta semiovata obtusata, margine antico concavo sub apice bidenticulata, postico toto (basi recurvo-cristata excepta) argute spinulosa, d. sub 15; cellulæ minutulæ.

1. PLAGIOCHILA BURSATA (Desv.)

Jung. bursata Desv. Journ. de Bot. 1824, p. 59; *Plagiochila* b. G. L. et N. Syn. Hep. 33.

Hab. Var. *Andina*, Andes Quitenses in sylva *Canelos*, ad arborum truncos, alt. 1500–1800^{m} : forma foliis aureis ; etiam in descensu montis *Chimborazo*, alt. 1200^{m} : forma foliis badiis dissitis.—Planta formosa cujus typus (foliis apice inciso-ciliatis, non autem bifidis) in Antillis primum inventa fuit.

F 5·0 × 1·5, 5·25 × 1·0 ; *c* $\frac{1}{16}$–$\frac{1}{12}$ × $\frac{1}{6}$–$\frac{1}{5}$; *per* 5·0 × 3·0^{mm}.

Caules 4–9-pollicares, in cæspites sæpe pendulos congesti, tenues flexuosi, subsimplices et innovando-elongati, vel parce suberecte ramosi, ubique foliosi.

Folia nitida, aurea vel badia, subimbricata vel dissita, squarrose disticha, prælonga, semiovato-lanceolata longe sensim acuminata (i.e. scalpelliformia), apice profunde (ad $\frac{1}{3}$) inciso-bifida vel inæqualiter trifida, laciniis subulatis acuminatis, raro solummodo 3–4-spina, cætero margine plerumque integerrima, rarius postice 1–2-denticulata ; cellulæ tenues, $\frac{1}{16}$–$\frac{1}{12}$^{mm} longæ, bis terve longiores quam latæ, pachydermes.

Foliola (raro ubique præsentia) foliis 2–3plo breviora, subulata, flexuosa, apice integra vel bifurca.

Flores ♀ terminales, ex innovatione subrecte continua sæpe ad speciem laterales. Bracteæ 2–4-jugæ arcte imbricatæ late ovatæ acuminatæ toto margine inæqualiter spinosæ.

Perianthia involucro subæquilonga, cuneato-campanulata vel subobovata, inflata subplicata, ore compresso incurvo oblique arcuato plurispina.

Differt a cæteris omnibus fere *Plagiochilis* cellulis foliorum elongatis quasi-Hypnoideis, involucris capitatis polyphyllis et perianthiis subplicatis. Nostra var. *Andina*, ob folia apice bicrura *Herbertam* simulat.

2. PLAGIOCHILA TUNGURAGUENSIS, Spruce.

Hab. Andes Quitenses, in M. *Tunguragua*, alt. 2100–3000^{m}, ubi ad arborum truncos magnis cespitibus viget.

F 3·25 × 1·75 ; *c* $\frac{1}{24}$; *per* 3·75 × 3·25^{mm}.

Caudex repens tenuis brevissimus. Caules elati, 4–6-pollicares, assurgentes pendulive, iteratim (ad sexies) innovandi, vel monotropi vel ex parte dichotomi.

Folia badia subimbricata, distiche patula vel plus minus decurvo-secunda, semiovata, apice subacuto pauci-dentata, dentibus brevibus 3–5, margine antico subrecto recurvo basi longe decurrente, postico convexo superne subrepando ; cellulæ majusculæ pachydermes, inferiores duplo longiores quam latæ, subapicales vix elongatæ, oblongæ vel subrotundo-hexagonæ.

Flores ♀ capitati. Bracteæ 3-jugæ, foliis majores, grosse subspinoso-dentatæ.

Perianthia parum emersa, late campanulata, compressa, hinc ala brevi lineari aucta vel exalata, ore spinoso-dentata.

Species nobilis, cum nulla alia confundenda, involucris conspicuis ad *Pl. bursatam* accedens.

3. PLAGIOCHILA RUTILANS, Lindenb.

Sp. Hep. 47, t. 9·11.

Hab. Ad arbores in sylvis Andium orientalium, alt. 1000–1200^{m} super M. *Campana*, &c. Etiam in Brasilia, Mexico, &c., invenitur.

F 3·0 × 1·5, 2·0 × 0·75 ; *e* $\frac{1}{28}$; *per* (*juv.*) 2·5 × 1·0^{mm}.

Caules 3-pollicares penduli tenuiusculi ; parce innovandi, cæterum vix ramosi.

Folia rufescentia imbricata vel subdissita, patula, semiovata ; margine antico valide recurvo integerrima, basi longius decurrentia ; postico supra medium apiceque rotundato spinuloso-dentata, dentibus sub 10 breviusculis ; cellulæ mediocres vix oblongatæ pachydermes. Folia ramulina (ubi adsunt) angustiora, apice sæpe argutius 5-spinosa.

Flores ♀ terminales (pauci) innovatione hinc vel utrinque suffulti. Bracteæ sub-bijugæ, foliis latiores, magis spinosæ, media basi concava perianthio adpressæ.

Perianthia (immatura) haud emersa, obovato-campanulata, basi subtetragona, superne compressa, ore rotundato longe spinulosa, acie antico exalata ("tenuiter alata," Lindenberg).

Var. *æquatorialis*. Caules 6-pollicares et longiores, interdum ramulis microphyllis subpinnulati, apice tamen floriferi, sub flore innovati. Folia dissita, apice 2–5-fida-spinosave, cæterum integerrima raro margine postico 1–2-dentata; ramulina bicuspidata. Perianthia matura (3·75 × 2·0^{mm}) oblonga vel subobovata, basi turgida tetragona, ore compresso subrecte truncato spinosa.

Obs. Pl. pectinata Lindenb., ex exemplis Montagneanis, in insula *Bourbon* lectis, difficillime separanda videretur.—In devexis sylvaticis montis Tunguragua et juxta fl. *Pastasa*.—Forsan eadem ac *Pl. divaricata* Lindenb. l. c. t. 32.

4. PLAGIOCHILA HYPANTRA, Spruce.

Hab. Andes Quitenses in spelunca *Sicsi-huaico* dicta ad pedem montis *Tunguragua;* etiam ad scopulos umbrosos in eodem monte et in sylva *Canelos*.

F 1·75 × ·75 ; 1·25 × ·6, 1·0 × ·5, ·75 × ·37 ; *c* $\frac{1}{50}$–$\frac{1}{35}$^{mm}.

Caules 1½–3-pollicares, filiformes, prostrati, implexi, vage ramosi, subpinnati vel subdichotomi, æquifoliati.

Folia fulva virescentiave, imbricata conferta, horizontaliter patula, convexa vel subplana, a basi obliquâ oblonga vel semiovato-oblonga, acuta obtusave, margine antico subrecurvo integerrima, postico apicem versus apiceque spinuloso-dentata, dentibus 2–6, inæquilongis, medio plerumque multo longiore ; vel sæpe (ramorum præcipue) apice truncato-bidentata, dentibus acutatis rectis divergentibusve, cæterum integerrima ; cellulæ parvulæ æquilateræ, ad angulos incrassatæ. Flores non habui.

This plant lines the roof of a cavern called *Sicsi-huaico* (*Sicsi*, the Inca name of the Pampas-grass, *Gynerium argenteum*, and *huaico*, a cave or hollow) near the village of Baños, at the foot of Tunguragua, and occurs also on shady rocks in the same neighbourhood. I was unable to find flowers of either sex, yet I could not identify it with any species in perfect state growing near it, nor can I now safely attribute it to any described species. Old and decaying plants often get completely hidden under adventitious ramuli, growing from their leaves, and bearing minute bifid leaves that quite resemble those of a *Cephalozia*. While certainly allied to *Pl. rutilans*, it is possibly still nearer *Pl. latevirens*, to which the ramification and the rather closely-set leaves approximate it.

5. PLAGIOCHILA NEGRENSIS, Spruce.

Hab. in sylva Amazonica ad truncos cariosos prope pagum Venezuelanum *San Carlos del Rio Negro.*

F 2·0 × ·75, 1·75 × ·75 ; *c* $\frac{1}{3\frac{1}{2}}$; *per* 2·5 × 1·55^{mm}.

Caules 2-pollicares intertexti teneri, in vivo subnigri in sicco rufescenti-badii, sub quater innovandi—sæpius dichotomi, alii ex innovationibus unilaterabus ad speciem simplices et geniculati.

Folia flavo-viridia dissita vel vix imbricata, linea subrecta diagonali cauli inserta, ligulato-oblonga vel potius rhomboidea, 2–3plo longiora quam lata, margine antico recurvulo subdecurrente integerrima, apice subtruncato argute 4-spina quadrifidave, spinis inæqualibus, raro una alterave subpostica adjecta ; cellulæ mediocres suboblongæ.

Flores ♀ terminales plerumque dichotomiales. Bracteæ 1–2-jugæ foliis majores perianthio basi adpressæ, toto margine postico spinoso-dentatæ.

Perianthia subemersa obovato-campanulata, exalata, superne compressa, ore lato rotundato longe ciliata.

Species pulchella, ab affinibus facile distincta. *Pl. divaricata* Lindenb. Sp. Hep. t. 32, caules habet subpinnatos, raro furcatos, bracteas foliis subconformes—interdum subminores—et perianthia cylindrico-oblonga ore angustiora. *Pl. tenuis* Ldnb. l. c., forsan magis affinis, folia habet duplo minora, apice inæqualiter 2–4-dentato-spinosa.

6. PLAGIOCHILA CHINANTLANA, Gottsche.

Mex. Leverm. p. 12, t. V.

Hab. in montibus Mexicanis ubi a cl. LIEBMANN primum lecta fuit ; in Andibus Granatensibus juxta *San Sebastian* ditionis Caucanæ legit amicus R. CROSS, a. 1878.

F 3·0 × 2·0, 3·0 × 2·3 ; *c* $\frac{1}{3\frac{1}{2}}$; *per* 4·5 × 3·0^{mm}.

Cæspitosa fuscescens. Caules e caudice prostrato suberecti vage subdichotomi 2-pollicares.

Folia laxe imbricata vel subdissita subopposita semiovata vel semiovalia, patula vel sæpius devexo-secunda, apice lunato-bispinosa, dentulo uno paucisve interpositis, utroque margine basi recurvo—interdum tam valide ut folia convoluta evadunt, antico subrecto sub apice paucidentato, postico rotundato ab ipsa fere basi inæqualiter spinoso-dentato, dentibus omnibus 20–27, 3–7 cellulas longis ; cellulæ mediocres subæquilateræ, pariete ad angulos incrassato, inferiores suboblongæ.

Flores dioici : ♀ terminales, innovatione unica vel duabus (interdum iterum innovatis) suffulti. Bracteæ perianthio appressæ, foliis majores et magis spinosæ.

Perianthia subemersa obovato-campanulata anguste alata (ala inermi) ore compresso bilabiato spinoso-ciliata.

Andrœcia sæpius terminalia longe ovato-fusiformia ; bracteæ foliis consecutivæ, sensim minores ovatæ concavæ apice patente obtusatæ muticæ, vel oblique cuspidulatæ. Antheridia cujusque bracteæ 6, quorum 3 v. 4 precociora, subglobosa stipitata.

Pl. oresitropha S., huic foliis suboppositis persimilis, diversa est foliis subsemicordatis, crebrius sed brevius spinulosis, apice obtusis ; præcipue autem perianthio alte emerso, vix involucrato, exalato.

7. PLAGIOCHILA DISTINCTIFOLIA, Ldnbg.

Spec. Hep. I., p. 17, t.; G. L. et N. Syn. Hep. 30.

Hab. ad truncos, prostratos præcipue et putrescentes, in tota planitie æquatoriali, prope *Pará* Amazonum, *Manáos* Negrensium, &c. Invenitur quoque in Antillis, Brasilia et Guiana.

F 3·0 × 1·75, 2·75 × 1·5; *c* $\frac{1}{28}$mm.

Caudex tenuis longe repens subnudus. Caules 1–3-pollicares ascendentes intricati vage subramosi vel prolifero-dichotomi.

Folia flavida vel rufescentia, subimbricata vel dissita, distiche patula et recurvo-secunda, semiovato-oblonga obtusa, basi (ramea præcipue) breviter cuneata et e marginibus ibidem recurvis ad speciem cuneato-obovata, margine antico infra apicem paucidentata, postico toto, basi excepta, argute spinuloso-denticulata, dentibus sub 20 (i.e. 18–25) late subulatis; cellulæ mediocres subæquilateræ, nisi ad angulos leptodermes.

Flores ♀ terminales, cum innovatione. Bracteæ foliis majores, magis profunde incisæ, dentibus haud raro iterum denticulatis.

Perianthia (juvenilia) immersa oblonga, ore compresso bilabiato ciliata.

Andrœcia spicata, pro more terminalia; bracteæ plurijugæ parvæ, dimidio infero erectæ saccatæ supero squarrose patentes spinosæ, monandræ.

Obs. The plant above-described was named from a Guiana specimen given me by Montagne, and purporting to be genuine, of *Plagiochila distinctifolia* Lg. (=*Pl. patula* var. β N.), but it agrees very imperfectly with Lindenberg's figures and description, nor do the latter agree with each other. For, while the stem is described as "iterato-dichotomous," it is shewn in tab. III. fig. 1 (nat. size) with a laxly pinnate ramification, only some of the branches being forked, and with perianths terminal on both stem and branches, either with or without a unilateral innovation. Then the leaves are said to be four times as long as broad (1 × $\frac{1}{4}$ lin.) with which none of the magnified figures agree, figs. 3, 8a and 8b shewing them only twice as long as broad. The leaves in fig. 2 come nearest to those of my plant in shape and cutting, and differ considerably from the rest of the figures.

Gottsche in 'Mex. Leverm.' acknowledges Lindenberg's *Pl. distinctifolia* to be a composite species, but does not succeed in shewing to which form the name should be limited. He has separated one form, as a species, under the name *Pl. irregularis* G., but his "*Pl. distinctifolia, Typus Mexicanus* . . . ramis primariis iterato-dichotomis subdivaricato-ramosissimis" differs more from my plant and Montagne's than even Lindenberg's description does.

It is singular that I nowhere found fertilized female flowers, or even full-grown perianths, although the plant abounds in Amazon forests, and the prince's-feather-like involucres are frequent and conspicuous. The European *Pl. spinulosa* is in similar case, for, although plants of both sexes are common enough, especially in the British isles, fruit has nowhere been found.

8. PLAGIOCHILA ORESITROPHA, Spruce.

Hab. Andes Peruvianos, in montibus *Campana* et *Guayrapurina*, ad truncos saxaque.

F 2·5 × 2·0, 3·25 × 2·75; *c* $\frac{1}{28}$–$\frac{1}{24}$; *per* 3·75 × 2·0mm.

Caudex repens ramosus exfoliatus. Caules 2–3-pollicares, rufi, ascendentes, apice sæpius iteratim innovando-floriferi, dichotomi vel (ex innovationibus unilateralibus) quasi simplices et geniculati.

Folia rufescentia, subopposita, dense imbricata, decurvo-secunda, valde convexa, latissime semiovata-cordatave obtusa, margine antico revoluto distanter denticulato basi longius decurrente, postico (basi recta excepta) crebre argute sed breviter spinuloso-dentata, dentibus omnibus numero 46–40; cellulæ mediocres, vel majusculæ fere, æquilateræ.

Flores ♀ in caule terminales, innovatione suffulti; bracteæ (vix propriæ et a perianthio dissitæ) foliis conformes nisi paulo latiores.

Perianthia emersa, basi subnuda, rufo-flava, oblonga, superne compressa, exalata, ore truncato ciliata.

Foliis suboppositis, latioribus, basi sæpius semicordatis, margine crebre spinulosis, a *Pl. gymnocalycina* distincta.—In iisdem locis advenit varietas *clavæflora*, elatior, robustior, perianthiis clavato-oblongis; a qua differt *Pl. longiflora* Mont. (e *Chili* allata) foliis alternis obovatis e perianthiis ore rotundatis.

9. PLAGIOCHILA SYLVICULTRIX, Spruce.

Hab. in planitie Amazonica prope *San Carlos del Rio Negro*, ad truncos prostratos, sterilis.

F 2·25 × 2·4, 2·75 × 2·3, 2·5 × 2·25; *c* $\frac{1}{40}$mm.

Caudex repens tenuis intricato-ramosus. Caules erecti 1½–2-pollicares rufi simplices vel subdivisi, ramis suberectis.

Folia rufo-flavida *subopposita*, dense imbricata, patula vel sæpius decurvo-secunda, latissime semiovato-orbiculata, margine antico recurvo infra apicem subbidenticulata, postico toto, basi prælonga recta excepta, argute spinoso-denticulata, dentibus sub 18, brevibus; cellulæ parvulæ æquilateræ subopacæ.

Flores non aderant.—Foliis latissimis, interdum latioribus fere quam longis, minute opace areolatis, ab affinibus distincta.

10. PLAGIOCHILA SIMPLEX (Sw.).

Jungermania simplex Sw. Prodr. Fl. Ind. occ.; *Plagiochila s.* Lindenb. Sp. Hep. 54, t. 9.

Hab. super truncos prostratos in Andium radicibus orientalibus ad *Tarapoto*, *Canelos*, &c., nusquam (ut videretur) in montes altiores ascendens; in planitie ad *San Carlos del Rio Negro* legi. Etiam in ins. Caribæis, Mexico et Brasilia observata fuit.

F 2·0 × 1·25; *c* $\frac{1}{28}$; *per* 3·0 × 1·3, 2·0 × 1·0mm.

Caudex late repens subexfoliatus. Caules multi, subpollicares ascendentes simplices, furcati, vel apicem versus fasciculato-ramosi.

Folia pallide rufula subimbricata recurvo-secunda, late semiovata rotundata, marginibus basi tam recurvis ut folia cuneata appareant, antico apicem versus denticulata, postico toto fere apiceque argute breviuscule spinuloso-dentata, dentibus 16–22; cellulæ mediocres æquilateræ leptodermes.

Flores ♀ terminales, innovationibus oppositis persæpe suffulti. Bracteæ 1-jugæ, foliis latiores, toto margine crebre spinulosæ, perianthium basi laxe (vel vix) amplectentes.

Perianthia subexserta, obovata vel lanceolato-obovata, basi tetragona, superne compressa, ore complanata bilabiata crebre spinuloso-ciliata. Capsula parum exserta.

11. PLAGIOCHILA GYMNOCALYCINA, Lehm. et L.

Jungermania g. Lehm. pug. pl. rar. V.; *Plagiochila gymn.* Lindenb. Sp. Hep. t. 10 et 31; G. L. et N. Syn. Hep. 32.

Hab. ad truncos, prostratos præcipue et putrescentes, in tota planitie Amazonica, nullibi autem copiosa; in Andium radicibus tam orientalibus quam occidentalibus magis frequenter et ad 1500^{m} alt. usque invenitur.

F 2·5 × 1·8, 1·9 × 1·2; *c* $\frac{1}{2}$^{s}; *per* 3·0 × 1·5, 3·3 × 1·2^{mm}.

Caules 1–4-pollicares, e caudice prostrato, bis terve geniculato-innovandi vel alternatim subramosi, sæpe penduli et intertexti.

Folia rufo-badia caduca alterna, imbricata vel subdissita, recurvo-patula-secundave, late semiovata rotundata (ramea angustiora basi cuneata); margine antico recurvo decurrentia, infra apicem 1–2-dentata, postico apiceque argute spinoso-dentata, dentibus pro more 10–12, usque ad 24 vero inveniuntur; cellulæ mediocres æquilateræ pachydermes.

Flores ♀ terminales, cum innovatione unilaterali. Bracteæ unijugæ, vix propriæ, perianthio plus minus dissitæ, recurvo-patulæ, cæteris foliis paulo magis dentatæ.

Perianthia basi subnuda et in caulem sensim angustata, pyriformia vel anguste obovata, exalata, inferne tetragona, apice compressa subbilabiata longispina.

Planta ♂ magis ramosa, ramis apice bifidis vel fasciculato-ramulosis. Andrœcia spicæformia tenuia ramulos totos fere tenentia, polyphylla; bracteæ parvæ, apice patulo sæpius exciso-bidentatæ, monandræ.

Var. *ciliato-dentata* S., elatior, dentibus foliorum longioribus ciliiformibus tota fere longitudine cellulis uniseriatis constantibus. Forsan pro specie propria habenda.—In M. *Campana.*

12. PLAGIOCHILA CHIMBORAZENSIS, Spruce.

Hab. Andes Quitenses, in monte *Chimborazo*, e ramis pendula.

F 3·0 × 1·75, 3·75 × 2·5; *c* $\frac{1}{36}$–$\frac{1}{32}$; *per* 6·5 × 2·5^{mm}.

Caudices 3–6-pollicares rubri validi *densifolii* penduli. Caules (ramive) 3–6-pollicares, arcuantes, sæpius assurgenti-secundi, simplices bifidive, raro apice prolifero-furcati.

Folia rufescentia, decurvo-secunda raro subpatula, imbricata, late semiovata, superne sensim angustata imo vero subacuminata, margine antico recurvo basi valde oblique decurrente infra apicem denticulato, postico (basi integerrima excepta) spinuloso-denticulato, dentibus 12–24, parvulis, aliis tenuioribus ciliiformibus; cellulæ mediocres suboblongæ.

Flores ♀ terminales. Bracteæ foliis vix diversæ, suberectæ, perianthii basi adpressæ vel ab eodem dissitæ.

Perianthia magna rufo-flava anguste pyriformia vel obconico-obovata, anguste obsoleteve semialata, ore compresso subrecte truncato ciliata.

Est quasi *Pl. gymnocalycinæ* forma gigantea, differt autem foliorum forma valde diversa et singulari.—*Pl. longiflora* Mont., subaffinis, foliis obovatis et perianthio ore rotundato distinguitur.

13. PLAGIOCHILA MACRIFOLIA, Tayl. in hb. Jameson. G. L. et N. Sp. Hep. 634.

Hab. Andes Quitenses in montis *Chimborazo* descensu occidentali, in sylvis excelsis ad arborum ramulos, alt. 1200^{mm}.

F 2·5 × 1·0, 2·75 × 1·1 : *c* $\frac{1}{32}$—$\frac{1}{24}$; *per* 4·0 × 1·25, 4·5 × 1·0^{mm}.

Caudex repens ramosus foliosus vel denudatus. Caules 2–3-pollicares, tenues erecti, vage divisi dichotomive, angulo furcæ acuto; vel superne ramulos 3–6 fasciculatos apice floriferos edentes, vel denique laxe pinnati, ramis elongatis interdum ramulosis.

Folia fulva fuscave, plus minus dissita, recurvo-patula-secundave, semi-ovato-lanceolata obtusa vel acuta, margine antico recurvo longiuscule decurrente apicem versus, postico toto fere apiceque spinoso-dentata, dentibus 9–13 breviusculis; cellulæ mediocres, inferiores oblongatæ, superiores subæquilateræ.—F. ramea angustiora subligulata.

Flores ♀ terminales innovatæ. Bracteæ propriæ nullæ.

Perianthia flava prælonga, 3–5plo longiora quam lata, basi nuda, clavata vel anguste pyriformia, inferne tetragona, superne compresso-plana, exalata, ore subconstricto rotundato spinoso-ciliata. Capsula oblonga, in pedicello perianthium duplo excedente.

Obs. In hac specie frequenter adveniunt ramuli epiphylli foliis minutis bicuspidatis cæterum integerrimis vestiti.

Var. *angustifolia* S. Folia 4plo fere longiora quam lata (3·25 × ·75^{mm}), lanceolato-ligulata, e marginibus basi recurvis cuneata, apice, margine postico supra medium et antico apicem versus spinoso-dentata.

Var. *Taylori* S. Rami e foliis longe dissitis fragilibusque sæpe primo visu subnudi. Folia linearia vel lanceolato-linearia, e marginibus basi recurvis cuneata, apice spinoso-bidentata, cæterum integerrima rariusve denticulo uno alterove postico armata.

Habitant varietates cum forma perfectiore in eodem monte *Chimborazo*. Var. *Taylori* (=*Pl. macrifolia* Tayl. in London Journ. of Bot. 1846, p. 270; G. L. et N. Syn. Hep. p. 634) etiam in monte *Pichincha* a cl. JAMESON, in sylva *Llalla* montis *Azuay*, alt. 2700^{m}, ab auctore inventa est.

Obs. Extreme forms of this might easily be taken for distinct species, but all limits break down on comparison of a large series of specimens. The ligulate branch-leaves of the first form are much narrower than the stem-leaves, but are quite like the stem-leaves of the second form. Only the third form—with narrow, almost linear leaves, entire except for 2 or 3 sharp teeth at the summit—was known to Taylor, and only in the barren state. All the forms are notable for the long clavate perianths, standing out beyond the leaves, *i.e.* destitute of any involucre; as in *Pl. gymnocalycina* and a few other allied species.

14. PLAGIOCHILA AEREA, Tayl.

Lond. Journ. Bot. (1846); Gottsche Mex. Leverm. 45, t. 10.

Hab. Andes Quitenses, in M. *Chimborazo*, ad ramulos (R. S.). Prope *Quito* (JAMESON). Mexico (LIEBMANN).

F 2·0 × 1·0, 2·0 × ·75, 2·0 × ·45 ; *c* $\frac{1}{20}$—$\frac{1}{16}$; *per* 2·5 × 1·0^{mm}.

Caules 3-pollicares tenuissimi, prostrati, intricati, monotrope semel, bis terve innovandi, rarissime dichotomi.

Folia virescentia parvula dissita patula suboblique lanceolato-linearive-oblonga acuta, margine antico recurvo integerrimo, rarissime 1–2-denticulato, postico a basi fere apiceque dentato-longispino, dentibus circiter 8, subulatis acuminatis, 2 vel 3 apicalibus sæpe prælongis unde folia 2–3-fida evadunt; cellulæ majusculæ, duplo triplove longiores quam latæ, pachydermes.

Flores ♀ terminales, innovati. Bracteæ propriæ nullæ.

Perianthia exserta, basi nuda, parva, oblonga obovatave tetragono-compressa, exalata, ore subbilabiato longispina.

Ab omnibus *Pl. frondescentis* formis differt foliis margine postico toto fere nec solum apicem versus spinosis, dentibus longioribus, reti cellularum laxiore, denique perianthio exinvolucrato. A *Pl. macrifolia* foliis et præcipue perianthiis longe brevioribus distincta. *Pl. tenuis* Lindng. Sp. Hep. t. 10, habitu similis, diversa est foliis apice solo inciso-dentatis cetero margine integerrimis, et perianthio distincte involucrato. *Pl. bursata* longe distat statura multo elatiore, perianthio involucro polyphyllo velato; solum accedit foliis angustis paucispinis et cellulis linearibus.

15. PLAGIOCHILA PROCERA, Lindenb.

Spec. Hep. t. 7; G. L. et N. Spec. Hep. p. 40.

Hab. Andes Quitenses, in monte *Tunguragua* et in sylva *Canelos*, ad arborum truncos, alt. 1500–2400^{mm} (R.S. anno 1857, antea JAMESON in hb. Hook.)

F 6·0 × 4·0, 5·25 × 3·25; *c* $\frac{1}{40}$—$\frac{1}{28}$; *per* . . . ^{mm}.

Caules e caudice valido prostrato ad speciem subnudo erecti pendulive, 5–6-pollicares, parce acuteque innovando-ramosi, densifolii.

Folia viridia, flavida, fusciduláve, opaca, sæpius conferta, opposita, distiche patula, ovata vel ovato-oblonga, basi late semicordata, auriculâ magnâ semiorbiculari caulem latitudine duplo superante recurvo-cristatâ, apice rotundata, toto margine (nisi ipsissima basi) dentato-spinulosa-ciliatave, ciliis crebris (45–65), 3–8 cellulas longis, cellulam unicam latis, sæpe hamatis; cellulæ medii folii mediocres subæquilateræ, submarginales autem multo minores sæpeque discolores.

Flores ♀ terminales. Bracteæ foliis majores, crebrius et longius spinoso-ciliatæ.

Perianthia (juvenilia) immersa, campanulata, compressa, antice spinoso-alata, ore bilabiato crebre spinoso-ciliata.

Planta ♂ pluries furcata, angulo dichotomiæ recto, ramis apice mediove floriferis. Andrœcia spicata julacea anguste ovoideo-fusiformia; bracteæ sub 10-jugæ, foliis sensim minores, tenerrimæ, appresso-imbricatæ, oblique subrotundæ ventricosæ, muticæ vel 1–2-denticulatæ—interdum 3-lobæ. Antheridia cujusque bracteæ 8–10, majuscula, pedicellata.

Obs. Jameson's original specimens, on which Lindenberg founded his *Pl. procera*, were probably gathered in the same places as my own; for *Baños*, the locality cited by him, is a village at the foot of *Tunguragua*, between that mountain and the Forest of *Canelos*, which begins a little lower down the same valley, of the river *Pastasa*.

16. PLAGIOCHILA PICHINCHENSIS, Tayl.

London Journ. Bot. (1846), p. 259; G. L. et N. Syn. Hep. p. 645.

Hab. Andes Quitenses, in fluvii *Pastasa* valle, supra montes *Tunguragua*

et *Abitagua* præcipue, alt. 2000–3000^{m}, ad arborum truncos ramulosque. In m. *Pichincha* primum legit W. JAMESON.

F 6·5 × 4·25, 7·5 × 5·0 ; *c* $\frac{1}{32}$–$\frac{1}{20}$; *per* 5·5 × 4·25^{mm}.

Caudex in cortice repens. Caules 5–6-pollicares, suberecti pendulive, parce et subdichotome ramosi.

Folia maxima flavida subopposita late imbricata, angulo recto fere divergentia, late semicordato-ovata, vel (auricula magna semiorbiculari excepta) ambitu fere triangularia, apice angustiusculo obtusa, basi parum decurrentia, basin versus utrinque integerrima, cæteroquin spinuloso-dentata-ciliatave, ciliis haud numerosis (20–25) grandiusculis, 3–10 cellulas longis, basi 1–4 c. latis, sæpe varie directis subtortisve; cellulæ medii folii majusculæ oblongæ, apicales lateralesque subæquilateræ.

Flores ♀ terminales (dichotomiales). Bracteæ 2–3-jugæ, foliis paulo majores, confertæ, basi postica latiores, gibbæ undulatæque, crebrius ciliatæ.

Perianthia omnino immersa, oblongo-orbiculata, compressa, ad medium usque bilabiata, labiis semiorbiculatis dentato-ciliatis, ciliis prælongis paucis, hinc latissime alata, ala 1·25^{mm} lata spinosa. Pedunculus perianthio duplo fere longior.

Andrœcia in ramis terminalia, sæpeque etiam media. Bracteæ oligandræ foliis minutius crebriusque ciliatæ, ciliis ad 40.

A *Pl. procera* differt foliis pellucidis vel medio solum subopacis, cellulis distincte majoribus, dentibus paucioribus irregularibus basin versus utrinque omnino nullis.

17. PLAGIOCHILA EXIMIA, Mitt. in lit.

Hab. ad arborum truncos in monte *Tunguragua*, alt. 2400^{m}.

F 5·0 × 3·5 ; *c* $\frac{1}{35}$^{mm}.

Forsan *Pl. proceræ* Ldnbg. mera varietas, differt autem sequente modo. Plantæ flavo-virides elatæ graciliores, magis flaccidæ, valde et subalternatim ramosæ, innovationibus sub flore ♀ pro more solitariis. Folia paulo minora semicordato-ovato-oblonga, haud subtriangularia, auriculâ sat minore (minime semiorbiculari) appressâ rarius recurvâ ; margine toto dentato-spinoso-ciliata, ciliis 60–70, 4–8 cellulas longis, peracutis (cellula apicali prælonga), alternis sæpe brevioribus, cilio ad auriculæ convexitatem majorem cæteris multo longiore—ad 12 cell. longo. Bracteæ crebre et prælonge spinoso-ciliatæ. Perianthium (juvenile) campanulatum bilabiatum ore ciliatum, ciliis mediocribus, omnino *exalatum*.—Anne eadem ac *Pl. flaccida* Lg. Spec. Hep. 78, t. 16 ?

18. PLAGIOCHILA CONSPICUA, Tayl. in hb. Jameson.

Hab. Andes Quitenses, in sylva *Cuelos* et super montem *Tunguragua*, ad arbores, alt. 1500–2700^{m} (R.S. 1857). In Andium devexis sylvaticis antea legit JAMESON.

F 5·25 × 3·25 × 2·0; *c* $\frac{1}{20}$–$\frac{1}{18}$; *per* 6·0 × 4·0^{mm}.

Caudex validus prostratus divisus. Caules 3–4-pollicares erecti pendulive densifolii, inferne simplices vel vage ramosi, superne dichotomi, angulo furcarum recto vel subdivergente, ramis interdum fasciculatis.

Folia aurea fulvave, crispula, subopposita, patentia, confertissima, longe semiovato-triangularia subobtusa, basi subsemicordata, auricula

rotundata minime vero semiorbiculari, margine antico valide recurva ; basi ipsâ utrinque exceptâ, circumcirca argute dentato-ciliata, ciliis 25–35, subæqualibus, 6–8 cellulas longis, basi 2–5 c. latis, subulato-acuminatis ; cellulæ majusculæ subæquilateræ, marginem folii anticum versus paulo elongatæ, pellucidæ.

Flores ♀ terminales (dichotomiales). Bracteæ unijugæ, foliis submajores, longissime ciliatæ.

Perianthia vix emersa vel subimmersa, obovato-campanulata, ore subrotundato longissime ciliata, hinc (vel utrinque) ala latissima ciliata percursa.

A *Pl. procera* formâ foliorum paulo diversa, auriculâ tamen minore, minus rotundatâ, ciliis paucioribus longioribus, cellulis multo majoribus pellucidis, &c., distincta.—Differt a *Pl. adiantoide* colore flavido, foliis confertissimis crispulis longioribus angustioribusque, ciliis magis numerosis, margine postico (basi excepta) fere recto, demum perianthio breviore multo latiore.

19. PLAGIOCHILA NOTIDOPHILA, Spruce.

Hab. ad rivulorum saxa in monte *Guayrapurina* Andium Peruvianorum, alt. 1000^{m}.

F 3·75 × 2·25 ; *c* $\frac{1}{32}$; *per* 2·5^{mm}.

Caudex repens subramosus caules plurimos 2–4-pollicares simplices vel semel innovandos edens.

Folia olivaceo-viridia, subopposita, imbricata, planiuscula, apice decurvula, dimidiato-ovato-oblonga obtusata truncatave, circumcirca (ad basin posticam præcipue) spinoso-ciliolata, spinis crebris (sub 50), 3–6 cellulas longis, basi 2–3 cellulas latis, margine antico recurvo anguste decurrentia ; cellulæ mediocres æquilateræ opaculæ.

Flores ♀ terminales. Bracteæ foliis multo majores crebre lati-spinæ.

Perianthia immersa (juvenilia ?) brevi-campanulata compressa exalata, ore obliquo spinosissima.

Obs. Folia textura iis *Pl. proceræ* similia, oblique autem ovato-oblonga nec semicordato-triangularia sunt, ad basin ipsam posticam longe 4–5-ciliata nec integerrima, cæteris dentibus brevioribus et pro m. latioribus.

20. PLAGIOCHILA ADIANTOIDES (Swartz.)

Jungermania adiantoides Sw. Fl. Ind. occ. p. 142 ; G. L. et N. Syn. Hep. p. 38.

Hab. Andes Quitenses, in sylvis *Cinchonæ* ad pedem montis *Chimborazo* occidentalem, fruticum ramulos investiens, alt. 1000–1500^{m}. Provenit etiam ex insula *Jamaica* cæterisque Antillis, necnon e *Mexico*.

F 4·0 × 2·5, 42·5 × 2·5 ; *c* $\frac{1}{24}$–$\frac{1}{20}$; *per* 6·75 × 2·5^{mm}.

Caudices validi in cortice repentes, caules 3-pollicares foliosos erectos pendulosve iteratim innovando-dichotomos vel (innovationibus duplicatis) fasciculato-ramosos proferentes.

Folia sat magna virescentia flavidave tenuia opposita subimbricata patentia, semiovato-oblonga, subsemicordata, margine antico recurvo, postico sensim incurvo (unde folium medio canaliculatum videtur) folio suprajacenti caulique arcte incumbente, nec recurvo ; toto margine (basi decurrente excepta) apiceque rotundato longe dentato-

spinosa-ciliatave, spinis ciliisve 30–32, subulato-acuminatis 7 cellulas longis, rectiusculis; cellulæ majusculæ æquilateræ pellucidæ.

Flores ♀ terminales (sæpe dichotomiales). Bracteæ unijugæ foliis majores, margine antico fortius recurvo, toto margine longius spinoso-ciliatæ, ciliis ad 13 cell. longis.

Perianthia maxima alte emersa, clavato-oblonga compressa, antice subanguste spinoso-alata, ore bilabiata, labiis rotundatis crebre longissime ciliatis, ciliis tenuibus rectis.

Var. (*l*) *aspergillifera* S., tenella, caule sæpe fasciculato-prolifero, innovationes 2–6-nas, apice solo foliosas aspergilliformes proferente.—*Hab.* Andes Quitenses in sylva *Canelos*.

Obs. Non dubitandum est quod ill. *Swartzius* sub nom. "Jung. adiantoides" plures species complexus est. E suo herbario tres formas *J. adiantoidis* examinavi, omnes specie plane diversæ: sunt.

1. Frustula sesquipollicaria olivaceo-et fulvo-viridia. Folia exacte opposita, $3{\cdot}5 \times 2{\cdot}0^{mm}$, ovato-oblonga obtusata, utrinque subdecurrentia, ipsissima basi excepta, circumcirca longe spinoso-ciliata, ciliis 39–40, aliis hamatis, anticis minoribus et remotioribus.—Cum *Pl. adiantoide* Lindenb. ac nostra supradescripta bene convenit.
2. Caulis (subcompletus) bipollicaris nigrescens fastigiatim subramosus. Folia $3{\cdot}0 \times 2{\cdot}5^{mm}$ subopposita subsecunda badia ovato-orbiculata, antice subdecurrentia, circumcirca fere minute spinuloso-denticulata, dentibus brevibus subinæqualibus, margine antico late valideque recurvo revolutove paucidenticulato; cellulæ æquilateræ, omnes fere æquimagnæ. Perianthia alte exserta compressa hamata, ad suturam anticam incrassata non autem alata, ore truncato minute denticulata. —Species forsan adhuc nondescripta, quum neque cum *Pl. adiantoide* nec cum *Pl. macrostachya* Lg. convenit.
3. Frustulum pollicare bifurcum. Folia badia obscure per paria approximata, $1{\cdot}4 \times 1{\cdot}3^{mm}$, ovato-orbiculata subtruncata, margine hic illic brevi-pauci-denticulata.

21. PLAGIOCHILA VIRENS, Spruce.

Hab. ad fruticum ramulos juxta fl. *Bombonasa*, in Andium radicibus orientalibus (Junio, 1857).

F $5{\cdot}2 \times 4{\cdot}0$, *c* $\frac{1}{16}$; *per* $\cdot 0 \times 4{\cdot}0^{mm}$.

Viridis tenella. Caules bipollicares apice semel bisve furcati.

Folia pro plantula magna imbricata distiche patula prælate semiovata rotundata; margine antico recurvo breviuscule decurrente basi pauciciliolato, medio subintegerrimo, apicem versus spinuloso; margine postico toto fere apiceque spinuloso, basi plerumque recurvo-cristato; dentibus omnibus 40–44, parvis, 3–7 cellulas longis, basi dilatatis apice setaceis; cellulæ majusculæ pellucidæ æquilateræ, ad plicam anticam paulo longiores, pariete subincrassato.

Flores dioici: ♀ in furca ramisque terminales. Bracteæ appressæ foliis perpaulo majores, subconformes, nisi pro margine toto spinuloso (d. 50).

Perianthia vix subemersa campanulata ore compresso bilabiata, labiis crebre (haud longe) ciliatis, antice alata, ala angustiuscula pro more dentata. Capsula subglobosa.

22. PLAGIOCHILA LEPTOPHYLLA, Spruce.

Hab. Ad fruticum ramulos juxta *Tarapoto*, in Andibus Peruviæ, alt. 500–1200m.

F 4·0 × 3·0–3·5 ; *c* $\frac{1}{20}$; *br* ♂ 1·5 × ·9mm.

Caules e caudice prostrato assurgente 2-pollicares parce dichotomi, apice e flore ♀ sterili innovationes utrinque 4 vel plures (pistillidia transformata) proferentes, ramulis sæpe eodem modo proliferis, ultimis aspergilliformibus (sc. medio nudis, apice penicillum foliorum parvulorum gerentibus).

Folia pallide viridia tenuia tenera subimbricata prælate semiovata rotundato-truncata, basi rectangula ; margine postico, a basi longa recta integerrima, late rotundato et cum apice, margineque antico (basi paulo recurvo) supra medium, dentato-spinulosa ; spinulæ 27–30, breviusculæ—alternæ sæpe breviores—subciliiformes, solum basin versus 2–3 cellulas latæ, apicales longiores subulato-setaceæ ; cellulæ majusculæ omnes fere subæquilateræ.

Flores dioici : ♀ terminales. Bracteæ toto margine profundissime laciniato-ciliatæ, ciliis ad 16 cell. longis, foliis vix majores.

Perianthia (valde juvenilia) ore longiciliata.

Pl. ♂ caules apice flabellatim dichotomi, ramis tenuibus julaceis flavidis androecia sistentibus. Bracteæ foliis plus triplo minores, oblique ovatæ, basi ventricosa erectæ, supra medium subpatulæ et inciso-spinosæ, tenerrimæ. Antheridia solitaria maxima globosa pedicello tenui æquilonga.

Foliis tenuibus, pro longitudine prælatis, a *Pl. adiantoide* pluribusque affinibus facile distincta species.

23. PLAGIOCHILA PACIMONENSIS, Spruce.

Hab. Ad arborum truncos in ripis fl. *Pacimoni* et ejus tribut. rivuli *Guayaguaca* Venezuelæ australis : pl. ♂. (R. S. Febr. 1854).

F 3·8 × 2·8 ; *c* $\frac{1}{20}$mm.

Caudex validus repens nigrescens. Caules 3-pollicares longe simplices apice flabellatim dichotomi, ramis masculis.

Folia e fulvo virescentia parum imbricata semiovato-oblonga rotundato-truncata, margine antico valide plicato-recurvo supra medium subdentata, postico toto fere apiceque argute dentata, dentibus omnibus sub 28 late subulatis—interdum fere triangularibus—pungentibus, 3–6 cell. altis, basi 2–6 cell. latis ; cellulæ majusculæ suboblongo-hexagonæ, ad plicam longiores sæpeque discolores.

Flores dioici : ♂ in flabellum terminalem dispositi ; rami amenta prælonga et tenuia—apice sæpe in caudiculam nudam, vel foliis paucis minutis terminatam, protracta—sistentia. Bracteæ fere minutæ imbricatæ ovato-linguæformes, basi erecta turgida convoluto-amplexantes ; dimidio supero recurvo-patulæ 1-vel pauci-spinosæ. Antheridia solitaria ovali-globosa flava, pedicello tenui æquilonga.

24. PLAGIOCHILA CULTRIFOLIA, Spruce.

Hab. Andes Quitenses, in monte *Chimborazo*, ad fruticum ramulos, alt. 1500m.

F 5·5 × 3·0, 4·5 × 2·0, 3·5 × 1·75 ; *c* $\frac{1}{20}$–$\frac{1}{18}$; *per* 5·0^{mm}.

Caules caudice repente 4–5-pollicares dendroidei, a basi tamen foliosi, supra medium iteratim 2—3-chotomi.

Folia pallida flavidave tenera, subimbricata vel subdissita, opposita, patula, semiovato-triangularia-oblongave, acuta, e basi antica recurva late longissimeque decurrente cultriformia, margine antico apicem versus, postico ab ipsa basi fere, valide dentato-spinosa, dentibus sub 20, ad ·6^{mm} longis, subulato-acuminatis ; cellulæ majusculæ suboblongæ.—F. ramulina minora, basi longius integerrima, dentibus apicis pauci-oribus majoribus.

Flores ♀ terminales, sæpius e dichotomiis. Bracteæ unijugæ foliis submajores, magis armatæ.

Perianthia emersa oblonga compressa, antice ala lineari spinosa percursa, raro exalata, ore bilabiato longiciliata.

Obs. Basis foliorum decurrens cætero folio æquilonga; ab hoc caractere a *Pl. adiantoide* et *Pl. ensiformi* facile distincta. A *Pl. adiantoide* differt insuper foliis ambitu subtriangularibus, apice acutioribus, dentibus latioribus, forma potius spinæ quam cilii.—*Pl. superba* Nees distare videretur foliis dense imbricatis longiciliatis.

25. PLAGIOCHILA MACROTRICHA, Spruce.

Hab. Andes Peruvianos, juxta pagum *Tavalosos* ad rivulorum saxa, alt. 900^{m}. A. Quitenses, in sylva *Canelos* ad rupes humectatas, alt. 1200^{m}.

F 6·2 × 3·0, *c* $\frac{1}{24}$^{mm}. In var. *f* 4·0 × 1·8, 3·5 × 1·5 ; *per* 3·5 × 1·5^{mm}.

Caudices late repentes validi implexo-ramosi. Caules 3–4-pollicares iteratim dichotomi, flexuosi, inferne subdenudati.

Folia flavido-vel olivaceo-viridia, sæpe maxima, late patula, subimbricata, semiovato-oblonga subfalcata ; margine antico integerrimo vel sub apice 1-2-dentato ad basin decurrentem recurvo, postico toto apiceque (subtruncato) spinis 10–20 prælongis—aliis ad 10 cellulas longis—superne capillaceis varie directis armata; cellulæ fere majusculæ subæquilateræ pellucidæ.

Flores dioici : ♀ dichotomiales. Bracteæ foliis submajores, crebrius spinosæ, cæterum conformes. (Perianthia valde juvenilia.)

Var. HUMILIOR. Bipollicaris. Folia minora margine antico supra medium subspinosa, postico longispina, spinis omnibus 14–22, basi 2 v. 3 cell. latis dein capillaceo-acuminatis; caulina magis, ramea minus (sed longius) spinosa. Perianthia emersa obconico-campanulata compressa, antice ciliato-alata, labiis ciliis erectis 1^{mm} v. 12 cellulas longis fimbriatis.—*Hab.* in sylva *Canelos*.

Ciliis foliorum paucis longissimis bene distincta species. Anne eadem ac *Pl. superba Nees* (Lindenb. Spec. Hep. 80, t. 17) quoad plantam in America tropica lectam? Australiensis autem, typica, distincta videretur habitu robustiore, foliis superne angustioribus, margine (antico præcipue) crebrius ciliatis.

26. PLAGIOCHILA ENSIFORMIS, Tayl.

Lond. Journ. Bot. (1846) p. 265 ; G. L. et N. Syn. Hep. p. 643.

Hab. Andes Quitenses (JAMESON), in sylva *Canelos* in stillicidiis (R. S.)

F 4·25 × 2·5, 4·0 × 2·25 ; *c* $\frac{1}{20}$ mm.

Caudex repens ramosus. Caules 4-pollicares subsimplices adscendentes, basi microphylli.

Folia pallide viridia opposita imbricata subpatula, subsemicordato-triangularia, e margine postico superne concavo ensiformia, margine antico recurvulo longius decurrente subintegerrima, postico (auricula incurvo-appressa excepta) dentato-spinulosa, dentibus parvis ad 20, apice truncato tamen dentibus majoribus 3–4-spinosa; cellulæ majusculæ.

Flores non habui.

Pl. ensiformis, sicuti a Tayloro descripta folia apice subtridenticulata, cæterum integerrima, habet; cæteris caracteribus cum nostrati congruit. —Anne forma *Pl. Pichinchensis* sterilis angustifolia ?—*Pl. cultrifolia* folia habet duplo longius decurrentia, paulo angustiora, longispina.

27. PLAGIOCHILA NOTARISII, Mitt. in litt.

Hab. in sylva *Canelos* et monte *Tunguragua*, ad saxa humectata, hepaticis frondosis consociata, alt. 1200–2400m.

F 5·5 × 4·5; *c* $\frac{1}{20}$—$\frac{1}{16}$; *per* 6·0 × 5·5mm.

Caudex prostratus divisus. Caules 5-pollicares validi rufescentes, innovando dichotomi vel, innovationibus cujusque lateris 2-vel 3-nis, fasciculatim et subflabellatim ramosi, ramis rectis rigidiusculis.

Folia maxima pallide viridia tenuia imbricata, explanata fere, latissime semicordata subtriangularia obtusata, basi prælata antice decurrentia postice rotundata, supra medium, vel apice solo, spinuloso-dentata, dentibus 8–12, tenuibus, inæquilongis, rarissime circumcirca fere spinulosa ; cellulæ majusculæ subæquilateræ pellucidæ.

Flores ♀ terminales (e dichotomiis). Bracteæ foliis paulo longiores, unijugæ erectæ, basi a perianthio dissitæ, toto fere margine argutius dentatæ.

Perianthia emersa, late campanulata vel suboblonga, ore truncato subbilabiato longiciliata, antice ala prælate spinosa aucta, in sicco haud raro a fronte, nec a latere, compressa.

Andrœcia flabelliformia, caulem comantia, ramulis plurimis, 18mm longis, semel bisve furcatis vel subpinnatis, microphyllis constantia; bracteæ saccatæ, cauli utrinque alte adnatæ, apice brevi patulo paucidentatæ, 1–2-andræ.

Hæcce pulcherrima stirps differt a *Pl. Jamesoni* foliis prælatis obtusatis (nec rotundatis), auricula basali incurvo-appressa, nec recurvo-cristata, et perianthiis ex involucro emersis.

28. PLAGIOCHILA JAMESONI, Tayl.

Lond. Journ. Bot. (1847); Mitt. (1851).

Hab. Andes Quitenses, in sylva *Llalla* montis *Azuay*, ad rivulorum saxa alt. 2500m (R. S. 1859); in monte *Pichincha* (JAMESON).

F 5·5 × 3·75, 5·0 × 3·5; *c* $\frac{1}{20}$; *per* 5·0 × 5·0mm.

Caudices ramosi intricati. Caules 6-pollicares dichotomi vel vage ramosi.

Folia magna viridia tenuia, opposita vel plane alterna, imbricata, subsemicordato-ovato-oblonga, apice prælato rotundato dentato-spinulosa, denticulata vel tantummodo repanda, cætero margine integerrimo vel postico uni-paucidenticulato, antico decurrente recurvulo; cellulæ majusculæ subæquilateræ.

Flores ♀ terminales, sæpe e dichotomiis. Bracteæ (vix propriæ) foliis subconformes et perpaulo majores.

Perianthia subemersa, late oblique campanulata, basi turgida, ore compresso alte bilabiata, labiis rotundatis minute crebre dentato-spinulosis, antice ala lata superne spinosa percursa. Pedicellus involucrum vix duplo superans.

Var. *secundifolia* S.: a forma typica foliis secundis latioribus, basi prælatis sed non semicordatis, margine postico repando-dentatis-spinulosisve, differt.—*Hab.* in saxis fluvii *Pastasa* irrigatis loco *Antombós*, alt. 1500mm.

29. PLAGIOCHILA ZYGOPHYLLA, Spruce. (Tab. XVII.)

Hab. Andes Quitenses, ad arbores in sylvis montium *Azuay* et *Guayrapata*, alt. 2800–3000m.

F 3·0 × 2·1; *c* $\frac{1}{24}$–$\frac{1}{16}$; *br* 4·0 × 2·25; *per* 5·5 × 3·2, *ala antica* 1·0 *lata*, *postica* ·25mm.

Caules 3-pollicares subramosi, interdum ex involucro stolones minutos aspergilliformes proferentes.

Folia subhorizontalia, patentia exacte opposita basique postica subconnata, paribus autem longiuscule dissitis, late semiovata apice anguste truncato 1–3-dentata rarius integerrima, basi antica recurva longe decurrente, postica rotundata appressa vel recurvo-cristata; cellulæ majusculæ pellucidæ parum oblongatæ, trigonis angularibus inconspicuis.

Flores ♀ terminales, vix unquam innovati. Bracteæ 1–2-jugæ, foliis longiores, apice margineque postico distanter dentatæ vel subspinosæ.

Perianthia ex involucro emersa, oblonga campanulatave, ore compresso suboblique truncato, vix rotundato, crebre setosa ciliolatave, a basi ad $\frac{2}{3}$ alt. utrinque alata, alis superne spinulosis, anticâ prælatâ. Capsula subglobosa breviter exserta.

Obs. Prima facie genus *Syzygiellam* nostram valde refert, perianthio autem *Pagiochilæ* perfecto distat. A *Pl. fuscolutea* Tayl., specie proxima, differt foliis minus erectis, dissitijugis; præcipue perianthiis late alatis, ore crebre setosis (nec calvis).

30. PLAGIOCHILA FUSCOLUTEA, Tayl.

Lond. Journ. Bot. 1846, p. 263; G. L. et N. Syn. Hep. p. 564.

Hab. in monte gramineo *Mulmúl* Andium Quitensium ad terram inter fruticulos; etiam super *Tunguragua* et *Pichincha* inter Ericeas et ad rivulorum saxa: alt. 2100–3300m.

F 3·0 × 3·0, 3·25 × 3·0; *c* $\frac{1}{24}$; *per* 4·25 × 5·0mm.

Caules 4–6-pollicares suberecti validi, æqualiter foliosi, subsimplices, fertiles innovando-furcati.

Folia fulva, subopposita, confertim imbricata, angulo 45° adscendentia, postice tam recurvo-cristata ut caules trialati viderentur, latissime suboblique ovata ovatove-orbiculata, apice rotundata, truncata, retusa vel exciso-bidentata, margine antico prælate recurvo longissime decurrente integerrima, postico undulato-repanda vel apicem versus repando-denticulata, raro apice subspinulosa; cellulæ majusculæ æquilateræ opacæ, trigonis angularibus conspicuis.

Flores ♀ in caule terminales (dichotomiales). Bracteæ foliis multo majores cordato-orbiculatæ concavæ, marginibus recurvis, apice magis denticulato.

Perianthia subemersa, late cupulato-campanulata, compressa, hinc ad medium usque fissa, exalata, ore subobliquo undulato-truncato integerrima.

Spicæ masculæ cauligenæ, foliis consecutivæ, terminales mediæve, linearioviodeæ. Bracteæ plurijugæ confertæ appressæ ovato-rotundæ ventricosæ, apice brevi lato reflexulæ, integerrimæ. Antheridia 4-na globoso-pyriformia, alia in stipite subæquilongo, alia in stipite triplo longiore, basin versus cellulis uniseriatis, superne 2–3-seriatis conflato.

Obs. Folia in exemplaribus Jamesonianis meisque ad *Pichincha* lectis magis dimidiata sunt, subtriangularia, apice angustiora et constanter fere integerrima; aliter autem a forma e monte *Mulmul* supra descripta haud differunt.

31. PLAGIOCHILA HETEROMALLA, Lehm. et Lindenb.

Sp. Hep. 83, t. 18.

Hab. Andes Quitenses, ad arbores in montis *Tunguragua* jugis sylvaticis, alt. 2200–2800^{m}. Peruvia et Chili (Sp. Hep. l. c.)

F 4·25 × 3·0; *c* $\frac{1}{3}$^{5}; *per* 7·5 × 2·5–3·0^{mm}.

Caudex validus, late repens, denudatus. Caules 4-pollicares erecti cæspitosi, vage vel subdichotome ramosi, inferne e foliis deciduis subnudi, ergo dendritici; rami adscendentes.

Folia sat magna fulvo-badia tenuia, late imbricata, alterna vel solum per paria subapproximata, distiche patula vel decurvo-secunda, late semicordata rotundata, circumcirca fere spinulosa ciliolatave (spinulis 40 et pluribus, 3–5 cellulas longis, aliis varie curvatis), basi antica longius oblique decurrentia, postica semicirculari recurvo-cristata; cellulæ parvulæ æquilateræ.

Flores ♀ terminales, innovandi, sæpe ex dichotomia. Bracteæ unijugæ, foliis parum majores latioresque, magis spinulosæ.

Perianthia maxima, involucrum duplo excedentia, oblongo-ovalia, superne complanata, apice subdecurvo bilabiata, labiis rotundatis crebre spinoso-dentatis, acie antico anguste spinoso-alata raro exalata. Capsula in pedicello perianthium duplo excedente subglobosa, pariete valido opaco. Elateres pertenues flexuosi, plerique dispiri, intra capsulæ apertæ valvulas diu persistentes. Sporæ minutæ.

Var. *latifolia* S. Folia imbricata plano-disticha (nec secunda) semicordato-orbiculata, tam lata quam longa (4·25 × 4·25, 3·5 × 3·5^{mm}.), margine antico subrecurvo supra medium dentata, postico toto fere breviter spinuloso-dentata, basi (*i.e.* auricula) plerumque plana, cauli appressa, dentibus omnibus 30–40; cellulæ submajores ($\frac{1}{24}$^{mm}). Perianthia 5·5 × 3·25^{mm}, oblonga vel subobovata, valde compressa, ore rotundato longispina, spinis sæpe subramosis, antice ad tertiam solam alata.—Anne species propria, *Plag. acanthostoma* mst. ?

Var. *densifolia* S. Folia latissime semicordata (4·5 × 3·25^{mm}), non autem orbiculata, margine antico fere recto vel etiam concavo, auricula valde recurvo-cristata. Perianthia subobovata, subalata vel lobulo (alam supplente) cum sutura intus connato aucta.—Habitant varietates cum typo in monte *Tunguragua*.

32. PLAGIOCHILA PACHYLOMA, Tayl.

Lond. Journ. Bot. 1846, p. 267.—G. L. et N. Syn. Hep. p. 641.

Hab. Andes Quitenses, in monte *Tunguragua*, ad arbores saxaque, alt. 2100–2800^{m}, ubi magis frequenter quam quisqualis *Plagiochila* invenitur; in cæteris Andibus rarius mihi videbatur.

F 2·75 × 2·0; *c* $\frac{1}{4}$^{S}; *per* 3·75^{mm} *longa*.

Caules 2–3-pollicares, erecti vel ascendentes, parce monotropo-innovandi vel dichotomi, ramique apice insigniter circinati.

Folia fulva fuscescentiave, subopposita vel plane alterna, conferta et vel distiche patula vel devexo-secunda, exacte cardioidea, basi latâ semicordata, apice rotundata; margine antico subrotundato fere stricto recurvulo integerrima, cellulis marginalibus 2–3-seriatis cæteris minoribus rufulis elongatis pulchre limbata, basi decurrentia; postico semiorbiculari longiciliata, ciliis sub 30, rectis rufo-badiis; cellulæ parvæ subæquilateræ pachydermes.

Flores ♀ terminales, innovati. Bracteæ foliis sensim submajores, oblatæ, crebrius ciliatæ, perianthio appressæ.

Perianthia emersa rufa late campanulata compressa, hinc vel utrinque ala ciliata aucta, ore lato oblique rotundato-truncato inciso-ciliata, ciliis subulatis, pulchre rufis.

Planta ♂ humilior, magis ramosa. Andrœcia tenuia, lineari-fusiformia; bracteæ sæpe plurijugæ, parvæ, basi turgida antice in auriculam incurvam dilatatæ, 1- (raro 2-) andræ.

Var. elatior, robustior, 4-pollicaris, magis et sæpe fastigiatim ramosa, foliis patulis vel subsecundis, pallidis, cellulis omnibus ciliisque fere concoloribus.—Ad terram inter Ericeas in monte *Tunguragua*.—A *Pl. homochromate* ramis æquifoliatis et foliis margine antico integerrimis diversa.

Pl. pachyloma varies exceedingly in aspect. Some forms have pale, others rufous foliage; some have it so bent back as to become secund, in others it is spread out nearly flat. In all forms the leaves have the semicircular postical margin equably set with long brown or red cilia, and the nearly straight antical margin bordered with narrow reddish cells, which give it a cartilaginous look, although not really thickened, as Taylor's name implies.

33. PLAGIOCHILA OXYPHYLLA, Spruce.

Hab. Andes Quitenses, in sylva *Llalla* montis *Azuay*, ad arborum truncos, alt. 3000^{m}.

F 2·0 × 1·6; *c* $\frac{1}{3\frac{1}{2}}$; *br* 3·75 × 2·5; *per* 2·5 × 3·5; *caps* 1·25 × 1·0^{mm}.

Caules suberecti bipollicares di-vel trichotomi, sub flore ♀ interdum subpinnulati, ramis apice strictis vix circinatis, aliis subbasalibus flagellaribus.

Folia subimbricata, horizontaliter patula, raro secunda, concoloria vel obscure rufo-marginata, dimidiato-ovata, basi subsemicordata, apice spinâ rectâ subulatâ acuminata, spinula altera subantica plerumque divergente adjecta, rarius apice subæqualiter bispinosa; margine antico recto late (sed non valide) recurvo decurrente integerrima, postico dentato-spinosa-ciliatave, ciliis basin versus crebrioribus, in toto margine 18 vel paucioribus; cellulæ mediocres, marginem apicemque versus sensim multo minores.

Flores ♀ terminales, raro dichotomiales. Bracteæ 1–2-jugæ subappressæ,

foliis majores et sat latiores, margine postico validius crebriusque spinoso-dentatæ, antico autem subrecto integerrimæ.

Perianthia albida, vix emersa, subcumpulata, apice compressa, ore convexo dentato-laciniata, laciniis crebris subulato-accuminatis, antice spinoso-alata, postice alâ brevi vel cristulis binis inferne aucta. Calyptra perianthio vix duplo brevior, subglobosa, demum bilabiatim rupta. Capsula parum exserta oblongo-globosa 6–7-strata. Elateres tenues dispiri, sæpe utroque fine solum monospiri. Sporæ elateribus paulo latiores subtæves.

Andrœcia tenuia lanceolato-fusiformia, ramulum totum vel ejus majorem partem tenentia. Bracteæ pauci-plurijugæ, 1–2-andræ.

Obs. The two postical crests of the perianth, where they exist, seem to arise from the soldering on of an interposed underleaf to the two lateral anthophyls; but such a floral underleaf is of very rare occurrence.—The species is certainly very near to *Pl. pachyloma*, but the habit is much slenderer, and the spinoso-acute, or acuminate, leaves, with much fewer marginal cilia, amply suffice to keep the two apart.

34. PLAGIOCHILA PERMISTA, Spruce.

Hab. Andes Quitenses, in montis *Tunguragua* rivuli saxis, cum *Pl. fuscolutea* Tayl. mixta.

F 3·25 × 2·5, 4·0 × 3·0; *c* $\frac{1}{30}$–$\frac{1}{32}$; *per* 4·0 × 2·5^{mm}.

Caudex prostratus ramosus subaphyllus. Caules 2–3-pollicares suberecti, simplices vel inferne subpinnatim ramulosi.

Folia flaventia alterna, laxe imbricata, distiche patula vel decurvo-secunda, late semicordato-ovata subtriangularia obtusata, auriculâ subrecurvo-cristatâ, margine antico recurvo decurrente integerrima, postico apiceque distanter denticulata spinulosave, dentibus inæqualibus divergentibus; cellulæ subparvulæ æquilateræ pachydermes.

Flores ♀ terminales. Bracteæ foliis submajores magis spinulosæ.

Perianthia subemersa, a basi cuneata oblonga compresso-plana, exalata, sutura antica tamen sæpe incrassata, ore oblique truncato spinuloso-denticulata.

Pl. oxyphylla S. foliis spinoso-acutis et perianthio bialato a primo visu diversa. *Pl. Jamesoni* Tayl. var. *homomalla*, subsimilis, perianthium insigniter alatum habet necnon folia opposita.

35. PLAGIOCHILA INCRESCENTIFOLIA, Spruce.

Hab. In monte *Tunguragua*, ad terram inter lichenes, alt 2300^{m}.

F inferiora 1·0 × 1·0; *c* $\frac{1}{30}$–$\frac{1}{24}$; *br* 3·5 × 3·5; *per* 4·5 × 4·5^{mm}.

Caules humiles subpollicares, e caudice tenui repente suberecti, basin versus flagella plura microphylla sæpe edentes, apice floriferi, simplices vel semel furcato-innovandi.

Folia rufescentia subtransversa, arcte imbricata devexo-secunda, e basalibus minutis usque ad involucralia magna insigniter increscentia, oblique orbiculata (subdimidiata); margine antico decurrente revoluto inferiora integerrima vel 1–2-spina, superiora paucispina; postico vix decurrente inciso-dentata, dentibus f. inferiorum 8—10, superiorum sub 20, retrorsum hamatis spinoso-acuminatis, 2 apicalibus longioribus (sinu altiori) sæpe iterum denticulatis vel dentulis intercalatis; *cellulæ* mediocres v. submajores subæquilateræ guttulatæ, in-

feriores mediæ majores subelongatæ, trigonis valde conspicuis circumdatæ.

Flores dioici: fœm. terminales, e basi innovandi vel non. *Bracteæ* maximæ, f. inferioribus triplo majores, erectæ appressæ, profunde incisæ.

Perianthia pro plantula maxima emersa compresso-campanulata, ore subrecte truncato profunde inciso-dentata, antice subsemialata, ala angusta integerrima denticulatave, postice carinata vel sæpe tricarinata, carinis basi plerumque cristato-alatis.

Folia flagellorum sæpe profunde bi- (subinde tri-) fida, laciniis divaricatis.—Eandem speciem ac. *Pl. implexam* (L. et G. Syn. Hep.; Gottsche Mex. Leverm. 76, t. 13) censerem nisi quod in hac folia caulina haud eodem modo sursum crescentia et f. involucralia perianthiaque multo minora viderim.—*Pl. uncialis* Tayl. (e Cap. Horn) cum nostra statura pusilla et caule increscentifolio conveniens, distat caule fastigiatim dichotomo, flagellis subnullis; foliis angustioribus, semiovato-triangularibus, margine postico ciliatis; perianthio ore rotundato longispino.

36. PLAGIOCHILA HOMOCHROMA, Spruce.

Hab. Andes Quitenses in monte *Tunguragua*, ad arborum truncos, alt. 2600^{m}.

F 3·25 × 2·75, 2·75 × 2·5; *c* $\frac{1}{24}$–$\frac{1}{20}$^{mm}.

Caules 2–3-pollicares tenues nigrescentes, valde et dichotome vel subfasciculatim ramosi; rami vario modo patentes nec in eundem planum porrecti, laxifolii, basin versus sæpe micro- (apice macro-) phylli.

Folia badia, opposita, dissita vel parum imbricata, recurvo-patula, semicordato-orbiculata, basi excepta, circumcirca dentato-ciliolata, dentibus inæqualibus, basi antica recurvula subdecurrentia; cellulæ majusculæ æquilateræ pellucidæ, marginales cæteris concolores et perpaulo minores.

Flores ♀ terminales. Bracteæ foliis multo majores, sub 2-jugæ, sese perianthiumque arcte amplectentes, vix magis crebre dentatæ.

Perianthia (juvenilia) cuneata, breviter bilabiata, labiis ciliatis.

A *P. pachylomate* differt ramificatione; foliis magis dissitis, margine antico rotundato et ciliolato (nec subrecto, integerrimo), cellulis majoribus concoloribus; bracteis pro foliis inferioribus maximis.—Caractere ad *Grandifolias* accedit, aspectu tamen omnino *Pl. pachylomatis*, cui etiam folia subopposita interdum adsunt.

37. PLAGIOCHILA CALOMELANOS, Spruce.

Plagiochila Sacttonii Duby Mst.?

Hab. Andes Quitenses, in monte *Tunguragua*, super fruticulos (*Ericeas* etc.) sustenta.

F 6·25 × 5·0, 7·5 × 6·0; *c* $\frac{1}{20}$^{mm}.

Caules 4–6-pollicares debiles flexuosi reptantes subsimplices.

Folia maxima, tenera fusca, siccando fere nigra, alterna, sæpius dissita, distiche patentia solumque convexo-recurvula, ovato-orbiculata, basi postica late semicordata plana caulem paulo superantia, circumcirca fere crebre minute ciliata, ciliis 1-3 cell. longis plerumque

cellulam unicam basi latis; cellulæ subæquilateræ, mediæ majusculæ, marginales 2–3-seriatæ multo minores saturatius coloratæ.

Fl. ♀ terminales, innovandi. Bracteæ foliis paulo majores. Cætera haud visa.

Pl. *pachylomati* affinis sed ut videtur distinctissima. Ad *Pl. Hookerianam* forma foliorum accedit, differt caulibus subsimplicibus (nec fasciculato-ramosis) caudice repente carentibus. Quum frustulum mancum stirpis Dubyani solum vidi, de ejus identitate cum plantula supradescripta minus certus sum.

38. PLAGIOCHILA STOLONIFERA, Lindenb. et Gottsche.

Syn. Hep. 655; G. Mexik. Leverm. 64, t. 11.

Hab. Andes Quitenses, in monte *Tunguragua*, ad terram inter Ericeas etiam ad arborum truncos.

F 1·75 × 1·5, 1·5 × 1·68; *c* $\frac{1}{10}$; *per* 4·0 × 4·0, 2·5 × 2·5^{mm}.

Caules 3–6-pollicares, e caudice prostrato cito dissoluto oriundi, cæspitosi foliosi flexuosi et vel vage ramosi, vel dichotomi, vel haud raro apice fasciculato-ramosi dendroidei, ramis arcuantibus, hic illic stolones subaphyllos, solitarios vel fasciculatos, varie flexos proferentes.

Folia badia, novella flavida, haud arcte imbricata, interdum subdissita, per paria approximata, decurvo-secunda, late semicordato-ovata; margine antico subrecto subdecurrente integerrimo, recurvo vel perianthium versus revoluto; postico dentato-spinuloso-ciliatove, dentibus sub 10 (8–12) inæqualibus, duobus apicalibus sæpe majoribus (unde folia exciso-bidentata evadunt); cellulæ parvulæ æquilateræ. Folia stolonum sæpe cuneato-obovata, apice 3-spina, deciduissima.

Flores ♀ terminales, cum vel sine innovatione. Bracteæ bijugæ, erecto-appressæ, foliis submajores, margine undulato-crispo argute spinoso.

Perianthia late campanulata, hinc subspinoso-alata, ore compresso oblique subrotundato spinoso-dentato, spinis circiter 20.

Pl. fragilis Tayl., affinis, folia habet basi utrinque longissime decurrentia, inciso-spinosa, apice profunde bifida.

39. PLAGIOCHILA FILICAULIS, Spruce.

Hab. Andes Quitenses, in montis *Tunguragua* umbrosis ad terram.

F 1·12 × ·75, 1·5 × 1·0; *c* $\frac{1}{30}$; *per* . . . . .

Caules 3-pollicares cæspitosi erecti filiformes flexuosi iteratim dichotomi, raro vage divisi, ramis ascendentibus, aliis stoloniformibus e foliis deciduis sæpe flagellaribus.

Folia parva flavida caduca, dissita raro contigua decurvula late semiovata rotundata, basi plus minus cuneata, margine antico subrecto recurvulo plerumque integerrima, postico *inciso*-dentata-serratave—raro mere spinosa—dentibus laciniisve 6–10, subulatis acuminatis; cellulæ mediocres æquilateræ subopacæ.

Flores ♀ terminales (dichotomiales). Bracteæ bijugæ, appressæ, foliis multo majores, circumcirca fere longidentatæ.

Perianthia (juniora) campanulata ore profunde inciso-spinosa.

A *Pl. aerea* Tayl. differt perianthio distincte involucrato. Propior *Pl. stoloniferæ* videtur; diversa tenuitate, colore pallido; foliis multo

minoribus, profunde incisis, deciduis non vero fragilibus, denique cellulis majoribus diversa.

In eodem monte adest forma ejusdem (?) speciei, humilior, interdum fasciculato-ramosa, foliis magis devexo-secundis margineque antico validius recurvo. Perianthia vetusta suppetit, sat longa, obconico-cylindrica, compressa, dentibus apicis imperfectis.

40. PLAGIOCHILA COMPRESSULA, Nees.

Lindenb. Sp. Hep. t. 30 ; G. L. et N. Syn. Hep. p. 54.

Hab. Andes Quitenses, in *Cinchonæ succirubræ* sylvis montis *Chimborazo*, ad fruticum ramulos ; etiam in valle fluvii *Pastasa*, ad saxa et ramulos : alt. 1200–1500^{m} (R. S. 1857–1860). In cortice Peruviano legit LUCAS.

F 1·75 × 1·0, 2·5 × 1·5 ; *c* $\frac{1}{48}$; *per* 4·5^{mm}.

Caules 1–3-pollicares, suberecti, laxe cæspitosi, ter quaterve dichotomi vel (in var.) tetrachotomi, basi tenui aphyllâ flagella brevia sæpe edentes, apice insigniter circinati.

Folia parvula sordide flavida olivaceave confertiuscula distiche patulo-recurva valde convexa, cuneato-obovata-ovatave, plus minus dimidiata ; margine antico subrecto recurvo integerrimo, basi longissime decurrente ; postico rotundato profunde inciso-spinoso, spinis 7–12 inæqualibus lato-subulatis sæpe divergentibus, duabus apicalibus pro more prælongis ; cellulæ parvæ guttulatæ opacæ.

Flores ♀ dichotomiales. Bracteæ foliis majores, late semicordatæ, toto margine spinosæ ; bracteola parva ovali spinosa sæpe interjecta.

Perianthia emersa, cuneato-campanulata, compressa, ore lato oblique rotundato multispina, exalata. Capsula oblonga.

Folia siccando patula, nec appressa ac in *Pl. fragili;* margine inciso-spinoso *Tayloriam laciniatam* Spruce inter muscos referunt.

41. PLAGIOCHILA CENTRIFUGA, Tayl. in hb. Jameson.

Hab. Andes Quitenses (JAMESON in hb.) ; in sylva *Llalla* montis *Azuay* (R. S. Aug. 1859).

F 2·0 × 1·75, 1·75 × 1·5 ; *c* $\frac{1}{40}$; *per* 4·5^{mm}.

Caules 1–2-pollicares erecti dense cæspitosi nigri simplices bifidive, flagella autem hic illic edentes.

Folia ex olivaceo fusca conferta, e basi erectâ convexo-recurvula et secunda, suboblique ovato-orbiculata, antice paulo longius quam postice decurrentia, apice bispinosa, margine postico 4–10-spinulosa, spinulis breviusculis acuminatis, ant eo valide recurvo integerrima ; cellulæ parvulæ subæquilateræ pachydermes.

Flores ♀ terminales. Bracteæ foliis multo majores, plurispinæ.

Perianthia emersa late campanulata subcomplanata, hinc alata, ala infra apicem in spina abrupte desinente, ore oblique rotundato-truncato crebre spinoso.

Planta ♂ tenuior ; folia caulina minora dissitiora suborbiculata, apice spinoso-bidentata, sinu lato, vel 3–5-angula, angulis spinuloso-apiculatis. Androecia terminalia, rarius medio ramo posita ; clavæformia ; bracteæ orbiculatæ concavæ paucispinæ, basi antica lobulo incurvo unispino auctæ.

42. PLAGIOCHILA FRAGILIS, Tayl.

Lond. Journ. Bot. (1848); Mitt. (1851).

Hab. in monte *Tunguragua*, ad arbores necnon ad terram inter Ericeas, alt. 2100–2800^{m}, etiam in M. *Chimborazo*, alt. 1500^{m}.

F 2·0 × 1·25 ; *c* $\frac{1}{40}$–$\frac{1}{30}$; *per* 5·0^{mm}.

Caules e caudice prostrato tenui demum dissoluto orti, erecti, dense cæspitosi, 1–4-pollicares, sæpe pluries dichotomi.

Folia badia, olivacea fuscescentiave, fragillima, confertissima, devexo-secunda, late semiovata-cordatave ; margine antico recurvo (siccando revoluto) decurrente apice inæqualiter bidentata, rarius unidentata, postico rotundato spinosa, spinis sub 16, lato-subulatis inæqualibus divergentibus (sæpe ruptis) ; cellulæ parvulæ subrotundæ guttulatæ subpellucidæ. F. ramulina magis profunde bifida, raro trifida, utraque basi longissime decurrentia ita ut a latere visa cuneata videantur.

Flores ♀ terminales (axiales). Bracteæ foliis majores, toto fere margine spinosæ.

Perianthia alte emersa campanulata, exalata, ore compresso crebre spinosa.

A *Pl. compressula* distincta caule robustiore ; foliis magis confertis fragilibusque, minus longe decurrentibus, dentibus brevioribus numerosioribusque, cellulis magis distinctis.

43. PLAGIOCHILA PINNATA, Spruce.

Hab. Andes Quitenses, in arboribus montis *Tunguragua*, alt. 2400^{m}.

F 1·0 × 1·0, 1·5 × 1·5 ·; *c* $\frac{1}{48}$^{mm}.

Caules e caudice ad speciem nudo intricate ramoso erecti, bipollicares tenues rigidiusculi nigrescentes *pinnati;* rami 8–10-jugi alterni patentes curvuli, raro bifidi.

Folia parva fulvo-badia fragillima conferta, e basi erecta recurvo-secunda, oblique vel semicordato-orbiculata, tam lata quam longa, margine postico apiceque distanter spinosa, spinis sub 10, inæqualibus, apice nonnunquam bicuspidata ; cellulæ parvæ opacæ, folii insertionem versus multo laxiores et pellucidæ. Folia ramorum tenuiorum insigniter bifida, cætero margine paucidentata integerrimave.

Flores ♀ terminales. Bracteæ foliis majores longioresque, subconformes.

Perianthia (juvenilia) campanulata, ore argute laciniata.

Pl. abietina Nees. et *Pl. deflexirama* Tayl., habitu nostrati simillimæ, folia habent multo angustiora. *Pl. fragilis* Tayl., magis affinis, ramificatione dichotoma et foliis ovatis distincta est.

44. PLAGIOCHILA AMAZONICA, Spruce.

Hab. In tota planitie Amazonica sylvestri arborum ramulos necnon folia viva pulcherrime decorans ; in Andibus orientalibus multo rarior, supra 1200^{m} haud visa.

F 4·5 × 3·5, 4·5 × 3·0 ; *c* $\frac{1}{20}$–$\frac{1}{18}$; *per* 5·0 × 2·0^{mm}.

Caudex subramosus, in arborum ramulis foliisque longe arcte adrepens, haud raro pedalis ! Caules sæpius ultra matricem in planum horizontalem expansi, substratificati, 1–4-pollicares, pinnati ; pinnæ paucæ pro more breves simplices, raro subramulosi vel innovando-furcati, prope basin parvifolii.

Folia parum imbricata dissitave, alterna, patentia, viridia vel jucunde

rosea, tenuia pellucida, prælate semiovato-oblonga, truncata; basi postica plerumque semicordata, auricula recurvo-cristata; antica recurva, apice explanata, toto margine longissime dentato-ciliata; ciliis sub 40, ad 12 cellulas longis, basi abrupte dilatatis, folii basin anticam versus magis confertis et haud raro bipartitis; cellulæ majusculæ æquilateræ.

Flores ♀ plerumque in ramulis terminales, raro innovatione suffulti. Bracteæ bijugæ, perianthio arcte adpressæ, margine antico fere replicato-recurvæ, circumcirca profunde inciso-ciliatæ.

Perianthia (rara) plerumque in ramulis terminalia, e cuneatâ basi oblonga (quasi lato-linearia) compressa exalata, ore truncato crebre ciliata.

Andrœcia longispica tenuia; bracteæ plurijugæ monandræ.

Var? *parvifolia*. Folia sæpius minora et subangustiora, magis dissita, basi utrinque subintegerrima, margine ibidem tam recurvo ut cuneata videantur, antice edentata vel paucidentata. Perianthia rarissima, etiamsi in eodem cæspite, ad fluvii Negro cataractas lecto, cum plantis ♀ inveniuntur plantæ ♂, magis pinnatim ramosæ, ramis andrœciis tenuispicis constantibus.—*Hab.* in planitie ad fluvium *Negro*, in Andibus ad montem Campana, alt. 1200^{m}. Anne eadem erit hæcce varietas ac *Pl. subplana* Lindenb. Sp. Hep. t. 14; Syn. Hep. 37.? Stirps autem a cl. G. A. Lindberg in Brasilia australi lecta, ad *Pl. subplanam* a Gottscheo ipso relata, diversa species est. Ut ut sit, nostra forma typica, cum perianthiis ad fl. *Bombonasa* lecta, forsan a forma *parvifolia* pro diversa specie habenda.

Exemplaria Lechleriana (No. 2524a !) ad *Tatanara* Peruviæ lecta, sub nom. "Pl. suplana" distributa, a *Pl. amazonica* certe valde diversa, nostræ *Pl. leptophyllæ* magis affinia.

45. PLAGIOCHILA LÆTEVIRENS, Lindenb.

Sp. Hep. 101, t. 20. *Pl. rectangularis* Tayl. in hb. Jameson.

Hab. in arborum ramulis fluvii *Bombonasa* inundatis, ad pedem Andium Quitensium orientalem, alt. 400^{m}; etiam in Venezuela boreali ad arborum radices rivuli *Guayaguaca*, fluvio *Pacimoni* affluentis, irrigatas.

F 2·5 × 2·0, 2·0 × 1·5, 1·75 × 1·5; *c* $\frac{1}{40}$; *per* 2·5 × 2·5^{mm}.

Caudex in matrice longe prorepens, caules frondiformes horizontales emittens. Caules 2–6-pollicares, basi sæpe flabellatim divisi, dein bipinnati, e ramis inferioribus prælongis in frondem triangularem rhombiformemve expansi.

Folia viridia, interdum flaventia vel olivacea, rarius rufula, alterna imbricata patentia, late semiovata, raro subsemicordata—caulina tamen fere semiorbiculata—marginibus basi valide recurvis revolutisve parum decurrentibus, antico fere recto apice rotundato excepto integerrima, postico apiceque spinuloso-denticulata, dentibus 10–12 brevibus inæqualibus; cellulæ parvulæ æquilateræ subpellucidæ. F. ramulina longe minora angustioraque, oblonga vel subobovata, superne vel apice solo paucidenticulata spinulosave.

Flores ♀ in ramulorum apice insidentes, raro innovatione suffulti. Bracteæ bijugæ, foliis ramulinis proximis duplo longiores, perianthium arcte amplectentes, basi postica valde ampliatæ, argutius spinulosæ.

Perianthia subemersa, cuneato-campanulata, basi turgida gibba, superne compressa, hinc (raro utrinque) alata vel semialata, ala integerrima, ore subobliquo spinosa, spinis confertis flexuosis.

Var. *Peruviana*, rufescens, foliis subdissitis siccando tam recurvo-constrictis ut linearia viderentur. In Andibus Peruviæ orientalibus, ad arborum truncos in humidis.

Obs. In this species, all the leaves, of both stem and branches, have the margins so strongly recurved at the base that they seem cuneate, and the general outline of the leaf obovate, whereas when flattened out they are found to be widest near the base, *i.e.* obliquely ovate, or semiovate, rarely semicordate. In the variety *Peruviana* the whole plant has a rufous tinge; the leaves are rarely at all imbricated, and in drying the margins are so strongly rolled back that the leaves seem widely-set and linear; yet when expanded by moisture their form and toothing are not sensibly different from those of the typical form.

A plant gathered on Mt. Campana has regularly, though laxly, pinnate stems, with sometimes as many as 12 pinnæ on each side, and a pinna usually bears a ♀ flower, apparently about midway, in reality the upper half is a subfloral innovation. This peculiarity, and the rather narrower leaves, 5- or 6-toothed at the rounded apex but entire elsewhere, lead me to suppose it a distinct species; but as I have only very young perianths, I am unable to describe it fully.

46. PLAGIOCHILA IMPLUVIATA, Spruce.

Hab. Andes Quitenses, ad saxa in umbrosis humidis montis *Tunguragua*, pl. ♀; etiam ad *Pallatanga*, pl. ♂.

F 2·5 × 1·75, 1·75 × 1·12; *c* $\frac{1}{3\frac{1}{2}}$; *per* 3·25 × 4·0^{mm}.

Caudex repens brevis subramosus. Caules 4-pollicares flabellatim subbipinnati, vel ex parte subdichotomi, basi e foliis ad squamulas breves redactis ad speciem denudati, dendritici; ramis primariis paucis patentibus, infimis multo longioribus.

Folia flavo-viridia imbricata patula vel subsecunda, late semiovata (ramea semiovato-oblonga) margine antico recurvo basi longe oblique decurrente integerrima, postico apiceque brevi-spinulosa (spinulis sub 12) basi edentata caulem subamplexantia; cellulæ mediocres subelongatæ, trigonis conspicuis intercalatis.

Flores ♀ terminales. Bracteæ foliis majores semicordato-oblongæ magis spinosæ.

Perianthia emersa oblato-campanulata, basi subinflata, apice latiora compressa rotundata crebre spinosa, antice tota longitudine alata, ala lata superne spinosa, interdum acie etiam postica alata.

Planta ♂ tenuior, laxe bipinnata, ramulis interdum furcatis, apice floriferis. Bracteæ 7–10-jugæ julaceo-appressæ, tenerrimæ, elongato-ovales, basi turgidæ, apice dentato-patulæ. Antheridia 4-(raro 5-) na ovali-globosa stipitata.—Folia caulina rameaque subangustiora, sæpe semiovalia, angulo 45° erecto-patenteia.

A *Pl. lætevirente* satis distincta videtur. Caules sunt robustiores, magis flabellatim divisi, ad ultimos ramulos latius foliati; folia omnia semiovata, nulla rhomboidea, siccando parum mutata nec revoluto-linearia; perianthia denique majora et multo latiora, spinoso-alata, ipso apice compresso-plana et insigniter dilatata.

47. PLAGIOCHILA MONTANA, Spruce.

Hab. in monte *Campana* Andium Peruvianorum ad saxa humectata, alt. 1300^{m}.

F 2·75 × 1·75, 3·0 × 1·9; *c* $\frac{1}{3\frac{1}{6}}$; *per* 3·0 × 2·25^{mm}.

Caudex repens ramosus. Caules 4–5-pollicares, nigrescentes, basi e foliis rudimentariis ad speciem nudi, superne in planum fere ramosi, pinnati, bipinnati vel tripinnati, ramis inferioribus sensim multo longioribus, frondem triangularem sistentes.

Folia viridia tenuia imbricata semicordato-ovata rotundata, margine antico recurvo longe oblique decurrente basi integerrima, supra medium sparse denticulata, postico (basi sola, subrecurvo-cristata caulem vix velante, excepta) apiceque spinuloso-dentata, dentibus circiter 20, parvis; cellulæ parvulæ æquilateræ.—F. ramulina duplo breviora, semiovato-oblonga argutius paucidentata.

Flores ♀ in ramis terminales. Bracteæ unijugæ foliis perpaulo majores, perianthio adpressæ, undulatæ, valide spinoso-dentatæ.

Perianthia terminalia, alte emersa, obovato-campanulata, superne compressa, ore lato subrotundato breviuscule spinoso-dentata, hinc late alata, ala subspinosa.

A *Pl. lætevirente* foliis longioribus, dentibus marginalibus duplo numero, perianthiis majoribus spinoso-alatis differt.—*Pl. Stephensoniana* Mitt., species Novo-Zelandica, aspectu et foliorum forma *Pl. montanæ* subsimilis, caules habet elatissimos, ramis crebrioribus magis densifoliis.—*Pl. impluviata* S. distinguitur colore viridi; foliis pro more subminoribus, basi haud semicordatis, margine antico integerrimis; perianthiis ore crebrius et longius spinosis.

48. PLAGIOCHILA FLABELLIFRONS, Spruce.

Hab. Andes Quitenses in monte *Guayrapata* ad ramulos.—Ramificatione ad *P. lætevirentem*, foliorum forma ad *P. proceram* accedit.

Caudex perbrevis (fere scutatus) caules plures imbricatos sæpe pendulinos edens. Caules 2–4-pollicares pinnati, bipinnati, vel etiam decompositi et in frondem flabellatam reniformem expansi; rami primarii tamen pauci (sub 4-jugi), inferiores sæpe multo longiores.

Folia subopposita, caulina maxima, ramea sensim minora (magnitudine media $3{\cdot}25 \times 2{\cdot}5^{mm}$) imbricata patula, flavida olivaceave, tenuia pellucida, latissime semicordata, margine antico recurvo integerrimo basi longe oblique decurrentia, postico apiceque rotundato spinulosa, spinulis sub 15, brevisubulatis inæquilongis, auricula semicirculari caulem late imbricante vel in cristam elevata; cellulæ $\frac{1}{36}$–$\frac{1}{28}{}^{mm}$, æquilateræ. *Involucra* juniora sola visa.

49. PLAGIOCHILA LONGISPINA, L. et G.

Syn. Hep. 642; Gottsche, Mex. Leverm. t. 10.

Hab. Andes Quitenses, in montibus *Tunguragua* et *Pichincha*, ad terram sub Ericearum umbra; etiam ad montis *Azuay* latera, in sylvæ *Llalla* locis graminosis umbrosis; alt. 2400–2800^{m}. Mexico, in monte *Orizaba* (LIEBMANN).

F $3{\cdot}75 \times 3{\cdot}0$, $2{\cdot}5 \times 2{\cdot}5$; *c* $\frac{1}{20}$–$\frac{1}{16}$; *per* $5{\cdot}75 \times 8{\cdot}5^{mm}$.

Caules 3–4-pollicares cæspitosi flaccidi, nigri badiive, adscendentes, ter quaterve dichotomi, furcis valde acutangulis.

Folia glauco-viridia, siccando flavida, tenerrima, parum imbricata, late patula, horizontalia sed convexula, oblique ovato-orbiculata, circumcirca crebre ciliata, ciliis longissimis (ad $\cdot04^{mm}$ vel 16 cellulas longis, basi 2 v. 3c. latis, apice tenuissimis flexuosis), basi antica sensim

decurrentia, postica caulem vix obvelantia; cellulæ majusculæ oblongo-hexagonæ.

Foliola parva caule velata, subquadrata, irregulariter plurifida; hic illic autem, juxta ramorum basin præcipue, advenit foliolum majus ovato-lanceolatum ciliatum.

Flores ♀ terminales, raro innovati. Bracteæ foliis vix majores, orbiculatæ creberrime ciliatæ.

Perianthia alte emersa, maxima, cupulari-campanulata, multo latiora quam longa, basi inflata, ore rotundato vix obliquo compressa laciniato-ciliata.

Obs. Folia paulo latiora, ciliis magis concinnis fimbriata, quam in icone Gottscheana, l. c.; cum ejus descriptione autem bene quadrat.

50. PLAGIOCHILA DIVERSIFOLIA, Gottsche?

Mex. Leverm. 47, t. 7 et 15. *Pl. palmulæflora* R. S. Mst.

Hab. Andes Quitenses, prope *Pallatanga* cordilleræ occidentalis, alt. 1800^{m}, ad fruticum pedem in rivuli ripis. Prope *Loja* legit G. E.. MASSEE; in Andibus Granatensibus LINDIG; in Mexico LIEBMANN.

F 3·25 × 1·75; *c* $\frac{1}{2}\frac{5}{5}$; *per* 3·75 × 4·5^{mm}.

Caules subtripollicares, nigrescentes, laxe implexi, 3–5-ies dichotomi, angulo furcarum subrecto vel divergente, subinde etiam parce alternatim ramosi.

Folia pallide viridia tenuia subdissita horizontalia convexiuscula, dimidiato-ovata, apice subtruncato sub 4-spina, margine antico recurvo integerrima vel 1–2-ciliolata, basi longe oblique decurrentia; postico 5–9-ciliata, ciliis parvulis sursum directis; cellulæ mediocres subæquilateræ pellucidæ. F. ramea subrhomboidea argutius incisa.

Ramuli fertiles simplices, apice clavato-incrassati, in perianthii basin sensim dilatati. Bracteæ unijugæ, perianthio dissitæ, foliis haud majores apice autem magis profunde incisæ.

Perianthia late spathulata, latiora quam longa, nuda, complanata, alte bilabiata, labiis dentato-laciniatis, laciniis a basi lata sensim acuminatis.

Obs. Perianthiis forma palmulæ lusoriæ, ramulo clavato insidentibus quasi-stipitatis, species insignis. Cum descriptione cl. Gottschei haud perfecte quadrat, eandem speciem esse tamen censeo. Fructum maturum nondum examinavi, fide Gottschei autem, l. c. "elateres solidi MONOSPIRI! Sub microscopio speciem edunt, ac si fibra flava unica circa baculum flavum spiraliter convoluta esset."

51. PLAGIOCHILA XANTHOCHROMA, Spruce.

Hab. Andes Quitenses, ad arborum ramulos prope *Baños* (R. S.); in monte *Pichincha* (JAMESON).

F 3·0 × 1·25, 3·5 × 1·7; *c* $\frac{1}{2}\frac{1}{8}$–$\frac{1}{2}\frac{1}{0}$^{mm}.

Tenuis flavida, emollita aquam cito flavo-tingens. Caules e caudice brevi repente radicelloso tripollicares, rubescentes, flabellatim dichotomi, ter quaterve furcati, furcis rectangulis, ubique æqualiter foliosus.

Folia alterna imbricata horizontalia late patentia, duplo vel fere triplo longiora quam lata, falcato-semiovata ex alis late recurvis canaliculata (in sicco convoluta et ad speciem dissita), basi decurrente

amplexicaulia, apice subtruncato breviter paucispina, margine antico concavo integerrima vel 1–2-denticulata, postico distanter dentato-serrata, dentibus omnibus 10–12; cellulæ mediocres subconformes vix oblongatæ, pariete ad angulos parum incrassato.

Flores utriusque sexus desunt.

52. PLAGIOCHILA DICHOTOMA (Web.)

Prodr. p. 133 (sub *Jungermania*); Lindenb. Sp. Hep. t. 13 et 17; G. L. et N. Syn. Hep. p. 35.

Hab. Ad ramulos in sylvis ripariis humidis juxta flumen Amazonum, præcipue ad pedem Andium orientalium secus fluvios *Pastasa*, *Bombonasa*, &c. Advenit etiam e Brasilia australiore, insula *Trinidad* aliisque Antillis, Africa et India tropicis.

F 2·75 × 1·63, 2·0 × ·9; *c* $\frac{1}{2}\frac{1}{8}$; *per* 3·0 × ·1·5^{mm}.

Caudex repens ramosus, caules subhorizontales 1–3-pollicares, flabelliformi-divisi, ex parte pinnati, ex parte dichotomi, raro fasciculato-ramosi.

Folia pallide viridia vel fulva, dissita vel subcontigua, vix unquam imbricata, caulina obovato- (rarius ovato-) oblonga, apice rotundato—raro etiam margine postico supra medium—spinuloso-dentata denticulatave, utroque margine basi subrecurva, antice decurrentia, dentibus 8–16, brevibus; folia ramea angustiora, rhomboidea vel ligulato-oblonga, apice paucidenticulata raro solummodo repanda retusave; cellulæ mediocres suboblongæ.

Flores ♀ terminales, sæpe dichotomiales; innovatione autem interdum unilaterali nullave. Bracteæ foliis submajores, 1-jugæ, toto margine subspinoso-dentatæ, perianthio appressæ vel subdissitæ.

Perianthia subemersa oblongo-campanulata, antice subspinoso-alata ore rotundato bilabiato spinosa.

Var. *patentissima* (= Pl. *patentissima* Lindenb. Sp. Hep. 64, t. 12). Viridior, sæpe subfurida, magis robusta, foliis minus dentatis, perianthiis exalatis.—Ad fluminis Amazonum affluentes inferiores, *Trombetas*, *Aripecuru*, *Ramos*, &c. arborum radices ramosque inundatos investiens.

Var. *fluitans* S. Caules 4–12-pollicares, foliosi, iteratim dichotomi, angulo furcarum acuto. Folia imbricata, latiora, flavido-olivacea, omnia subrhomboidea, apice rotundato, truncato retusove integerrima, raro repando-undulata.—Ad ramulos fluvii *Casiquiari* inundatos, socio *Hydropogonte fontinaloide* (Hook.) Brid., fluitans.—Forsan species propria = *Pl. fluitans* Mst.

Var. *rivicola* S. Planta ♂. Caules ascendentes 2–3-pollicares, pinnati, ramis paucis longis simplicibus, rarius bifidis. Folia fulva tenuia latiuscule imbricata (2·5 × 1·6, 1·7 × 1·1^{mm}) oblique oblonga ovatove-oblonga, apice rotundato pauci-denticulata, basi antica longe oblique decurrentia; cellulæ $\frac{1}{3\frac{1}{2}}{}^{mm}$ diametro, æquilatero-hexagonæ pellucidæ. Androecia terminalia tenuispica.—Ad rivuli saxa juxta *Tavalosos* Andium Peruviæ. Planta mascula *Pl. dichotomæ* videtur, licet pinnata nec dichotoma; distat insuper a typo foliis magis imbricatis oblongis, nunquam nec obovatis nec rhomboideis.

Obs. I have examined what purported to be an original specimen of Swartz's *Jung. patula*, from Jamaica, which is exactly what I have considered typical "*dichotoma*." It is very different indeed from the "*Plag.*

patula" of "Spec. Hepat.," where both figure and description are remote enough from anything I have ever gathered. Swartz, as is well known, preserved in his herbarium, and gave to his friends, sometimes two or more species under a name published in his Flora of the West Indies.

53. PLAGIOCHILA LAMELLISTIPULA, Spruce.

Hab. Andes Peruvianos, in montibus *Campana* et *Pingullu*, alt. 1100^{m} ad arbores.

F 3·0 × 1·5, 2·75 × 1·5; *c* $\frac{1}{3\cdot6}$; *per* 4·0 × 2·5^{mm}.

Caules e caudice repente ascendentes 3–4-pollicares parce dichotomi, angulo furcarum subdivergente, ramis longis arcuantibus subcircinatisve, neque attenuatis nec flagellaribus.

Folia fulva confertissima patula, sicca parum mutata, semicordato-acinaciformia apice acuto truncatove 3–6-spina, margine antico rotundato basi recurvo integerrima, postico recto vel subconcavo medium versus sæpius integerrima vel 1–2-denticulata, basi semicirculari breviter 5–8-spina; cellulæ parvulæ opacæ subæquilateræ.

Foliola orbiculari-reniformia vel subpeltata, primum biloba, utroque lobo plurilaciniato, basi utrinque e laciniis divaricatis hastata, media facie interna squamulis 1–4, lanceolato-subulatis sublaciniatis aucta.

Flores ♀ terminales. Bracteæ unijugæ perianthio appressæ, foliis majores, spinoso-serratæ undulatæ; bracteola foliolis paulo major, subconformis, persæpe perianthii tergo adnata.

Perianthia subemersa obovato-cuneata, antice posticeque anguste subspinoso-alata, ore compresso rotundato longispina.

Pl. hypnoide major, *Pl. cristatam* æmulans, ab his cæterisque congeneribus foliorum forma foliolisque differt; ramis pectinatim foliosis facie externa myriapoda nonnulla simulat.

54. PLAGIOCHILA THYSANOTIS, Spruce.

Hab. Ad truncos, præcipueque ad arbuscularum ramos, in sylvis flum. Amazonum humilioribus et recentioribus, in iis præ aliis juxta fl. *Negro* ripas frequens.

F 2·0 × 1·0, 2·2 × 1·2; *cell* $\frac{1}{4\cdot0}$–$\frac{1}{3\cdot5}$; f^{la} ·5; *per* 3·0 × 1·7, 3·5 × 1·5^{mm}.

Caudex in cortice longe arcte adrepens. Caules 1–3-pollicares, liberi et a matrice (sæpissime fruticis ramulo) utrinque horizontaliter patuli, stratificati, validiusculi stricti, in planum iteratim dichotomi, angulo dichotomiæ acuto, frondes semiorbiculares flabelliformesve efformantes, ramique pectinatim polyphylli.

Folia viridia vel flavida, ad vel ultra $\frac{1}{2}$ imbricata, semicordato-ovato-oblonga, vel superne fere parallellogramma, apice truncato 4–5-spina, margine antico recurvo longe oblique decurrente solum sub apice explanato et 1–2-dentato, postico spinuloso-serrato, spinulis omnibus ad 30, illis ad auriculam semilunatam amplexicaulem vel reflexam ciliiformibus hamatis; cellulæ parvulæ æquilateræ ad angulos conspicue incrassatæ.

Foliola parva 4–5-partita, laciniis flexuosis perangustis inæquilongis.

Flores dioici: ♀ in ultimis ramulis terminales, rarius e dichotomiis, Bracteæ 2–4-jugæ sese perianthiumque arcte tegentes, foliis majores, undulatæ basi dilatatæ, circumcirca inciso-serratæ, dentibus varie directis.

Perianthia subemersa obovato-campanulata, inferne turgida, superne 4-(interdum 5-6-) plicata—rarius complanata, ore rotundato-truncato spinosa, spinis sub 40 subulatis haud prælongis, antice brevi spatio alata. Capsula magna ovali-globosa, in pedicello perianthium vix superante.

Pro habitu et foliorum forma *Pl. distichum* L. et L. (Spec. Hepat. t. 33), valde refert; illa tamen certe diversa est foliis multo brevius spinulosis, auricula calva nec ciliata, et perianthio ore tenui-ciliato nec late laciniato.

Var. *megalostipa*, viridis, foliis paulo crebrius dentatis, foliolis magnis reniformibus (1·3 × ·8^{mm}) sæpe bilobis profunde inæqualiter laciniato-ciliatis, ciliis duobus mediis longissimis filiformibus.—*Hab.* ad fl. *Caipurá* fl. *Trombetas* tributarium; etiam ad Yurimaguas fluvii *Huallaga* in *Crescentiæ* cortice.

Huic persimilis est, quoad foliola magna laciniata, *Plagiochila Orbigniana* Mont. (Spec. Hepat. t. 20), cui tamen adsunt folia basi latiora longissime decurrentia, ad auriculam solum paucidentata neque crebre longiciliata.

Var. *fimbriata*, robustior, foliis angulo acutiore patentibus, angustioribus, prælonge ciliato-spinosis, ciliis ad auriculam creberrimis hamato-flexuosis. Foliola majuscula (·8 × ·6^{mm}) ovata in cilia plura profunde fissa, ciliis mediis prælongis filiformibus arcte articulatis.—*Hab.* ad fl. *Negro* superiorem intra Venezuelæ fines, locis *San Carlos* aliisque.

Forsan hæcce varietas, idem ac prior, melius pro specie propria habenda.

55. PLAGIOCHILA FIMBRISTIPULA, Spruce.

Hab. in truncis putrescentibus cum *Leucobryis* &c. mixta, in sylvis humilioribus juxta fluvii *Negro* cataractas.

F 2·0 × 1·0, 1·8 × ·9^{mm}; *f^{ta}* ·8–·9^{mm} *longa*; *c* $\frac{1}{40}$^{mm}.

Caules 3-pollicares ascendentes laxe cæspitosi, simplices bifidive, apice sæpe incurvi.

Folia pallida tenuia confertim imbricata semicordato-ovato-oblonga, subfalcata, margine antico valde concavo recurvulo longius decurrente integerrima, postico subcrispo superne spinoso-dentata ad auriculam cristatam ciliata, apice truncato sæpius 3–4-spina, dentibus omnibus sub 20; cellulæ parvulæ æquilateræ pellucidæ.

Foliola plus duplo breviova, latiora quam longa, plurilaciniata, laciniis ad 15, inæqualibus ciliiformibus varie flexis.

Flores ♀ terminales, innovatione suffulti. Bracteæ unijugæ, elongatæ, margine postico magis incisæ crispatæque.

Perianthia subimmersa campanulata compressa exalata, ore rotundato dentato-ciliata.

Pl. thysanotis differre videtur caule ramosiore; foliorum dentibus ciliisque magis numerosis; bracteis 2–4-jugis circumcirca inciso-dentatis; perianthiis superne semper fere plicatis.

56. PLAGIOCHILA HYPNOIDES (Willd.)

Hab. per sylvam Amazonicam, ad arbores præprimis pomiferas, locis

Caripi prope *Pará;* Manaos; Obidos; San Carlos del Rio Negro (in *Coffeæ* foliis vivis); &c.

F 2·5 × 1·3, 2·1 × 1·4; *c* $\frac{1}{40}$–$\frac{1}{35}$; *per* 3·0 × 2·1^{mm}.

Late depresso-cæspitosa, flavida; caules e caudice repente 1–3-pollicares dichotomi, pauciramei vel fere simplices, siccando apice sæpe circinati, foliisque arcte decurvo-secundis.

Folia imbricata, haud raro confertissima, angulo 70° patentia, semicordato-ovato-oblonga, apice rotundato-truncato 4–5-dentata; margine antico basi decurrente ad $\frac{1}{2}$ vel altius recurvo, sub apice 1-pauci-dentata; postico fere transverso, recto vel medio concavo, toto breviter dentato-serrato-spinulosove (d. omnibus 14–28, 4 cell. longis), auricula semicirculari reflexo-cristata distanter dentata interdum subcalva; cellulæ parvulæ æquilateræ vel suboblongæ plus minus opacæ, pariete incrassato.

Foliola parva semilunata, vel amorpha, plurifida.

Flores ♀ terminales, raro dichotomiales. Bracteæ subbijugæ, haud confertæ, patulæ, postice crebrius sed breviuscule dentato-laciniatæ; bracteolæ foliolis paulo latiores.

Perianthia emersa oblongo-campanulata inferne obtuse quadrangula, superne compressa, ore rotundato-truncato bilabiata plurilaciniata, laciniis sub 60 brevibus sæpe ciliiformibus, antice ala perangusta apice unispina tota fere longitudine percursa. Andrœcia in ramis terminalia—raro basilaria—ovoidea; bracteæ paucijugæ confertissimæ tenerrimæ ovatæ concavæ, apice patente dentatæ; antheridia 4-na magna brevipedicellata.

Jungermania hypnoides Willd. hb.

Plagiochila hypnoides Lindenb. Sp. Hep. *Plag.* p. 37, t. 7 et 11.

Nostra cum *Pl. hypnoide*, quoad stirpem Paraensem, l. c. depictam exacte convenire videtur. *Pl. serrata* β *surinamensis* ejusdem operis, t. 30 a *Pl. hypnoide* haud distinguenda; *Pl. serrata* Rothii typica tamen (op. c. t. 6) foliis dimidio supero fere parallelogrammis certe diversa erit.

Pl. Guilleminiana Mont. (e Guiana) forsan nil aliud esset nisi *Pl. hypnoidis* forma foliis paulo minus dentatis, auricula calva. Inter formas *Pl. hypnoidis* foliis magis dentatis gaudentes et *Pl. plicatam* Lindenb. & G. Mex. Leverm. t. 9, nullum discrimen invenio.

57. PLAGIOCHILA HORTORUM, Spruce.

Hab. Ventanas prope *Guayaquil* in *Theobromæ* cortice. Fl. *Caipurá*, flum. Amazonum tributarium, ad *Mangiferam indicam* et *Citrum Aurantiacum*.

F 2·0 × 1·0; *c* $\frac{1}{40}$; *br* 2·5 × 1·5; *per* 3·0 × 2·0^{mm}.

Pusilla cæspitosa viridissima tenera. Caules e caudice brevi repente 1–1½-pollicares flabellatim dichotomi. Folia conferta, angulo 70° patentia, subhorizontalia, semicordato-ovato-oblonga rotundata truncatave, margine antico longiuscule decurrente late alteque recurvo infra apicem 1–2-dentata, postico toto apiceque dentato-serrulata, dentibus omnibus sub 25, iis ad auriculam subreflexam setiformibus; cellulæ subconformes parvulæ, pariete incrassato.

Foliola nulla, vel parva et in setas 6–8 partita.

Flores dioici: ♀ terminales et dichotomiales. Bracteæ intimæ dilatatæ, apice et margine postico dentato-spinulosæ, antico serrulatæ; bracteola vel 0 vel foliolis vix diversa.

Perianthia emersa oblongo-campanulata, inferne turgida, ore truncato rotundatove compressa pluriciliata, ciliis 60–64, breviusculis subflexuosis, antice a basi ad $\frac{2}{3}$ alt., vel ad apicem usque, spinuloso-alata. Capsula magna ovali-globosa in pedicello perianthium vix duplo longiore suffulta.

A *Pl. hypnoide* et *serrata* diversa statura humiliore, teneritate; a priore foliis basi minus dilatatis, margine minus argute serratis.—Planta Amazonica a Guayaquilensi paulo differt foliis infra medium parum latioribus, auricula basi ipsa calva, dentibus paucioribus (15–20); perianthio longiore ovato-campanulato antice suturâ elevatâ percurso, vix tamen alato. Interdum adjicitur bracteola magna cordato-orbiculata breviter bifida margine spinosa.

58. PLAGIOCHILA FLORIDA, Spruce.

Hab. ad arborum ramulos fl. *Ramos*, flum. Amazonum tributarii, irrigatos. Ad arbusculas juxta rivulos Andium Peruvianorum prope *Tarapoto*.

F 2·0 × 1·0; *c* $\frac{1}{3\cdot5}$; *br* 3·0; *per* 3·2 × 3·0; *caps* 1·3 × 1·1^{mm}.

Viridis tenella, caule 2-pollicares pluries (ad 7-ies) dichotomo, ramis brevibus paucifoliis, terminalibus floriferis, nullo flore in furcis.

Folia subimbricata, apice solo dissita, basi breviuscule decurrente exceptâ angulo fere recto patentia, semicordato-ovato-ligulata, truncata—superne fere rectangularia vel rhomboidea, margine antico subrecto inferne recurvulo superne plano et infra apicem 1–2-dentato, postico apiceque inæqualiter spinosis, spinis omnibus 15–20 pungentibus, aliis brevibus aliis longioribus subulatis, ad auriculam depresso-sinuosam sæpe tenuibus hamatis; cellulæ parvulæ subpellucidæ, superiores fere æquilateræ subleptodermes, inferiores oblongo-hexagonæ, pariete subincrassato. Foliola nulla.

Flores dioici: ♀ terminales. Bracteæ propriæ bijugæ, foliis dimidio longiores subundulatæ, basi dilatatæ, margine plurispinæ, aliis spinis prælongis subulato-acuminatis varie flexis.

Perianthia subemersa campanulata, inferne turgida, apice compressa, antice suturâ elevatâ percursa (vix subalata), postice sæpe profunde hiantia, ore bilabiata, labiis rotundatis laciniato-spinosis; spinis paucis, magnis, omnibus sub 24 (dentulis 3 v. 4 utrinque ad rimam incomptis) sæpe per paria subdivergentibus. Pedicellus validus cellulas 10 crassus, cellulis tamen tenuissimis (ex siccatione?) sinuosis, perianthium perpaulo excedens. Calyptra perianthio $\frac{1}{2}$ brevior angustiorque ovali-globosa, demum lacera, basin versus 2 cell. crassa, ipsa basi pistillidiis sterilibus obsita. Capsula oblongo-globosa valida 4-valvis—valvula una alterave sæpe biloba—stratis 3 v. 4 conflata, strato intimo tenui (cellulis helice incompleto farctis), exterioribus sensim subcrassioribus (cellularum parietibus internis distanter trabeculatis nodosisve). Elateres longiusculi subobtusi arcte bispiri. Sporæ minutæ tetraëdro-globosæ læves.

Pl. serrata (Roth) folia habet basi sublatiora, margine brevius dentato-serrata, involucralia præcipue et perianthii orificium multo tenuius armata.

59. PLAGIOCHILA VENUSTULA, Spruce.

Hab. Andes Peruvianos, in M. *Guayrapurina.* ad saxa et arborum truncos, alt. 900^{m}.

F 2·0 × 1·0; *c* $\frac{1}{3\cdot2}$; *per* 1·5 × 1·0^{mm}.

Caudex repens ramosus, caules liberos 1–2-pollicares tenues æqualiter foliosos, laxe stratificatos, sæpe iteratim acute prolifero-dichotomos proferens.

Folia pallide viridia imbricata patula, longe semicordato-ovata, subscalpelliformia, auricula subrecurvo-cristata, margine antico recurvulo subdecurrente apicem versus bispinosa, postico ad ipsa basi apiceque (subobtuso) argute spinoso-dentata, dentibus omnibus sub 20, rectis hamatisve, apicalibus majoribus; cellulæ mediocres suboblongæ guttulatæ.

Foliola nulla.

Flores ♀ dichotomiales. Bracteæ 1–2-jugæ, foliis multo majores et magis profunde incisæ, laxiusculæ.

Perianthia (vix matura) immersa, campanulata, turgida, ore oblique truncato crebre laciniato-dentata perpaulo compressa, hinc late alata, ala apice spinulosa.

Obs. A very pretty, delicate species, with somewhat of the habit of a pale form of *Pl. dichotoma;* but in the scalpelliform leaves, with a subcristate auricle at the semicordate base, showing more approach to *Pl. hypnoides* and *cristata;* in reality distinct from all, and intermediate between the cristate and spinulose groups. The innovations arise usually from the very base of the perianth—more rarely from the axil of the outer bracts; and sometimes there is a pair on each side, making four in all.

60. PLAGIOCHILA RHIZOPHILA, Spruce.

Hab. ad arborum radices juxta fluvium *Pastasa*, alt. 1400^{m}, in Andibus Quitensibus.

F 3·0 × 1·75, 2·2 × 1·5; *c* $\frac{1}{36}$^{mm}.

Caules elati, 4-pollicares, erecti, basi sola exfoliati, bis—quaterve dichotomi, ramis fastigiatis subparallelis apice sæpe incurvis.

Folia flavo-viridia confertissima, distiche patula vel recurvo-secunda semicordato-ovata obtusa, margine antico revoluto distanter denticulata basi longe oblique decurrentia, postico (auricula semilunari integerrima excepta) denticulata, haud crispa, apice subspinulosa, dentibus omnibus sub 20, parvis; cellulæ parvulæ æquilateræ pellucidæ. Foliola nulla. Flores non habui.

Pl. Guilleminiana Mont.; Lindenb. Sp. Hep. t. 33; G. L. et N. Syn. Hep. 45; nostræ subaffinis, caules habet breviores, ramis minus fastigiatis; folia haud conferta, basi minus decurrentia, margine nisi apicem versus subintegerrima.

61. PLAGIOCHILA DISTICHA, Lehm. et Lind.

Hab. S. Gabriel da cochoeira, ad rupes inundatas. "Guiana et Sierra Leone" (Syn. Hep.)

F 2·5 × 1·1, 2·0 × 1·0: *c* $\frac{1}{40}$–$\frac{1}{35}$^{mm}.

Luride flavo-viridis in plagas latas prostrata; caules 3-pollicares æquifoliati, parum dichotomi vel fere simplices.

Folia angulo subacuto patentia parum imbricata—siccando ad speciem dissita—semicordato-ovato-ligulata subfalcata apice oblique truncata dentataque, margine postico toto distanter denticulata, antico longiuscule decurrente basi recurvulo integerrima, dentibus omnibus sub 10, ad auriculam parvam subappressam ciliiformibus perpaucis

cellulæ parvulæ oblongo-hexagonæ leptodermes subchlorophyllosæ Foliola submulla.

Flores ♀ terminales, innovatione plerumque solitaria suffulti. Bracteæ foliis submajores, margine postico toto laciniatæ.

Perianthia (rudimentaria) ore laciniata, laciniis breviusculis haud numerosis.

Habitus in sicco fere *Pl. dichotomæ*, a qua tamen sat longe distat species.

62. PLAGIOCHILA DEPRESSA, Spruce.

Hab. ad arborum truncos per fl. *Negro* totum, parcissime tamen observata, locis fl. *Tarumá*, *S. Gabriel*, et sylva *Javita* (Venezuelæ).

F 2·8 × 1·8, 2·2 × 1·3 (× 1·05, sine ciliis) ; *c* $\frac{1}{35}$–$\frac{1}{30}$ mm.

Grandiuscula prostrata stratificata pallide fusca apice virescens. Caules 2–3-pollicares flaccidi parum furcati polyphylli.

Folia imbricata, recentia et sicca subplana, basi antica longe arcuato-decurrentia, dein late (ad angulum 70°–80°) patentia, semicordato-oblonga, apice rotundato-truncato argute breviuscule dentato-spinosa ; utroque margine subrecto (*i.e.* parum rotundato) antico ad $\frac{2}{3}$ alt. usque recurvo, ab ipsa basi spinulis parvis remotis armato, postico sub apice spinuloso, cæterum ciliato, ciliis rectis haud confertis, nisi ad auriculam parvulam ubi crebris longioribus et incurvis ; dentibus omnibus sub 32, 3–8 cellulas longis. Cellulæ mediocres subconformes æquilateræ ambitu late opacæ, pariete conspicue incrassato.

Foliola nulla vel parva, in crura 3 filiformia partita.

Flores dioici : ♀ terminales, innovatione utroque latere—interdum binis—suffulti. Bracteæ foliis consimiles nisi pro margine toto longius ciliato antice revoluto. Bracteola (ubi adest) semicircularis margine in lacinias ciliiformes dissoluta. Perianthia (valde juvenilia) ore bilabiato ciliata, antice subalata.

Huic proxima est *Pl. hylacœtis* Spruce, differt autem rubedine, foliis confertioribus, ciliis crebrioribus, basalibus (ad auriculam magnam præcipue) longissimis.

63. PLAGIOCHILA HYLACŒTIS, Spruce. (Tab. XVIII.)

Hab. ad truncos putrescentes in sylvis primævis secus fluvios *Casiquiari* et *Uaupés*. Pulcherrima species !

F 3·75 × 2·0 ; *c* $\frac{1}{36}$ mm.

Cæspites lati ; caudices longe repentes, intricato-ramosi, matrici arcte adhærentes, exfoliati. Caules assurgentes, 1½–3-pollicares, simplices furcative, rarius ramos perpaucos edentes, ramique densifolii, sæpe basi apiceque attenuati, subinde in flagellum aphyllum abeuntes.

Folia pro more pulchre rubescentia, arcte imbricata, distiche patula, semicordato-ovata, apice rotundato spinoso-dentata ; margine antico revoluto, basi longe decurrente ciliata, medio integerrima, apice subspinulosa ; postico toto ciliata, basi semiorbiculari amplexanti-decurrente longissime creberrimeque ciliata, ciliis millimetrum (vel cellulas lineares 10–12) longis, dentibus cillisque totius folii ad 50 usque ; cellulæ parvulæ æquilateræ papuloso-prominulæ. Foliola ex more nulla.

Andrœcia terminalia polyphylla.

64. PLAGIOCHILA CRISTATA, *Sw. Prodr. p.* 143. *G. L. et N. Syn. Hep. p.* 46.

Habitat Andes Quitenses ad truncos in monte *Abitagua*, alt. 1500m.

F 4·0 × 1·5 ; *c* $\frac{1}{40}$–$\frac{1}{56}$mm.

Caules 4–6-pollicares e caudice repente erecti pendulive dichotomi subpinnative, *ramis flexuosis incurvisve sæpe in flagella abeuntibus.*

Folia pulchre aurea distiche patula elongato-triangularia scalpelliformia, basi profunde semicordata, margine antico subrecto subintegerrima longissime oblique decurrentia, postico subconvexo auriculaque semioblonga spinuloso-dentata, apice sæpius bispinosa, dentibus omnibus 20–30 ; cellulæ parvulæ elongato-hexagonæ vel subrectangulares, paucissimis vacuis exceptis chlorophyllosæ, basales precipue utriculos plurimos primordiales foventes. Flores non habui.

65. PLAGIOCHILA GYMNOTIS, Spruce.

Hab. ad saxa juxta rivulos, socia *Lejeunea longiflora* Tayl., prope *Tarapoto* Andium Peruvianorum.

F 2·1 × 1·5 ; *c* $\frac{1}{40}$; *br* 3·0 × 2·0 ; *br*^{ta} 1·1 × 1·0mm.

Flavo-viridis valde pellucida. Caules e caudice repente ascendentes bipollicares, ex parte pinnati, ramis oppositis, ex parte dichotomi.

Folia majuscula imbricata late patentia convexa semicordato-ovata, late truncata apiceque dentato-4-spinulosa, margine antico recurvo integerrimo vel sub apice unidentato, postico distanter 3–5-spinuloso spinulis latis acutis, auricula reflexa decurrente integerrima; cellulæ parvulæ omnes fere æquilateræ, vel suprabasales parum oblongæ, pariete ad angulos incrassato.

Foliola parva ad basin usque varie laciniata.

Flores dioici : ♀ terminales, hinc vel utrinque innovatione—simplice vel prolifera—suffulti. Bracteæ 2–3-jugæ arcte appressæ foliis dimidio majores, margine antico revoluto paucidentato, postico apiceque crebriuscule laciniato-spinosis undulato-crispulis; bracteola intima majuscula orbiculata margine laciniata, interdum extus lamellis spinosis 1–3 armata ; bracteola secunda parum minor ovalis.

Perianthia (juvenilia) campanulata, ore compresso rotundato-truncato plurilaciniata, antice spinuloso-alata.

Pl. flavescens L. et G. (Mex. Leverm. t. 17), subsimilis, folia habet longe crebrius dentato-spinosa.

66. PLAGIOCHILA PENSILIS, Spruce.

Hab. in monte *Chimborazo*, ad ramulos, alt. 1200m.

F 4·0 × 2·0 (*basi decurrente inclusa*); *br* 3·5 × 3·0; *per* 4·0 × 3·5mm.

Caules e caudice repente penduli, prælongi, 6-pollicares, pinnati et subbipinnati, ramis dissitiusculis incurvis.

Folia virescentia late imbricata, e basi profunde semicordata scalpelliformia; margine antico subrecto inferne recurvo-sinuato integerrima, ipsâ basi longissime decurrente exceptâ ubi minute 3-spinulosa, raro etiam sub apice unispina; margine postico, ad auriculam recurvo-cristatam præcipue, spinoso-ciliata, spinis 16–20 inæquilongis sæpe hamatis, mediis brevioribus dissitis, apicalibus duabus sæpe magnis (unde folia truncato-bispina evadunt); cellulæ parvulæ subæquales.

Flores ♀ in ramulis terminales. Bracteæ foliis caulinis subbreviores, dimidio latiores, rotundatæ acuminatæve, undulatæ, toto margine, basi anticâ præcipue, crebre longispinæ. Bracteola interdum adest, anguste oblonga, spinosa, cum altera vel utraque bracteæ alte connata.

Perianthia parum emersa compresso-poculiformia exalata, ore rotundato-truncato spinis prælongis subulatis armata.

A *Pl. cristata* Sw., affini, differt ramis apice nunquam flagellaribus; foliis latioribus, margine postico spinoso-ciliatis (nec solum spinuloso-dentatis), cellulis haud elongatis.

67. PLAGIOCHILA OREOCHARIS, Spruce.

Hab. Andes Peruvianos in monte *Campana*, alt. 1200^{m}, ad arbores.

F 2·5 × 1·5; *c* $\frac{1}{40}$–$\frac{1}{56}$; *per* 2·75 × 2·5^{mm}.

Caudex breviter repens, vel scutatus, multicaulis. Caules 3–4-pollicares, imbricati, basi sæpius flabellatim divisi, dein pinnati vel subbipinnati, aliis ramulis furcatis, floribundi.

Folia arcte imbricata amplexicaulia, distiche patula, late semicordato-ovato-oblonga vel subtrapezoidea, margine antico inferne recurvo longe decurrente integerrima vel apicem versus subdenticulata, postico apiceque (truncato vel rotundato) sparse denticulata, auricula magna subintegerrima vel spinulis varie flexis armata, dentibus omnibus 12–18, brevibus, inæqualibus; cellulæ parvulæ vix oblongæ.

Flores ♀ in ramulorum apice et dichotomia terminales. Bracteæ unijugæ, perianthio adpressæ, valde dilatatæ, latiores quam longæ, inciso-dentatæ.

Perianthia haud vel parum emersa, campanulata, tetragona exalata, ore lato valde obliquo compresso alte bilabiata spinoso-fimbriata.

A *Pl. hypnoide* differt ramificatione pinnata, nec dichotoma; foliis latioribus et (ad auriculam præcipue) minus dentatis; bracteis 1- (nec 2–4-) jugis; perianthio latiore exalato, &c.; demum montes ascendit quando *Pl. hypnoides* planitiem relinquere non solet.—Ad *Pl. impluviatam* et *Pl. montanam* inter *Frondescentes* accedit.

68. PLAGIOCHILA THYOIDES, Spruce.

Hab. Andes Quitenses, ad fluvium *Verde* fluvio *Pastasa* confluentem, in arbustorum ramulis.

F 2·2 × 1·2, 3·0 × 2·0, 3·0 × 2·25; *c* $\frac{1}{50}$; *f*^{la} ·75–1·0^{mm}.

Caules 4–5-pollicares validi erecti, basi simplices, dein pinnatim ramosi ramis vix semipollicaribus.

Folia flavo-viridia, conferta, distiche patula, late semicordata obtusa, basi utrinque longissime decurrentia, apicem versus spinuloso-denticulata, dentibus 6–12, brevibus, cæterum integerrima, margine antico revoluto, postico basi semicirculari crispulo; cellulæ parvæ æquilateræ.

Foliola triplo breviora, simplicia vel bi-tripartita, integerrima seu subspinosa, segmentis subulatis sensim attenuatis recurvo-canaliculatis, varie tortis involutisve et implexis, pellucidis.

Flores ♀ ad ramos terminales. Bracteæ foliis longiores 2-jugæ, postice undulato-crispæ, margine ipso postico spinoso-denticulatæ.

Perianthia campanulata, ore prælato obliquo longispinoso-ciliata, hinc alata, ala spinulosa.

P. deflexirama Tayl. (a JAMESON in M. *Pichincha* lecta) ramis pinnatis ac in nostra gaudet, differt autem absentia foliolorum, et foliis dimidiato-ovato-oblongis. *P. abietina* Nees, satis superque distincta foliis plus duplo minoribus, toto fere margine dentatis et ciliatis, necnon foliolorum absentia completa.

69. PLAGIOCHILA BRYOPTEROIDES, Spruce.

Hab. Andes Peruvianos, ad arborum radices in monte *Campana*, alt. 1200^{mm}.

F 2·0 × 1·0, 1·9 × ·9 ; *c* $\frac{1}{48}$–$\frac{1}{56}$^{mm}.

Caudex prostratus ramosus, foliis denudatus, multicaulis. Caules 3-pollicares, imbricati, arcte bipinnati, plumam ambitu lanceolatam fingentes, pinnis cujusque lateris usque ad 20, apice decurvulis ; alii basi in plumam bi-trifidam divisi.

Folia conferta patula semiovata-cordatave obtusata vel rotundata ; margine antico concavo recurvo apicem versus bidenticulata ; postico toto fere apiceque breviuscule argute spinuloso-denticulata, dentibus sub 15, basi integerrima caulem imbricantia et sæpe recurvo-cristata ; cellulæ minutulæ æquilateræ opacæ. Flores non aderant.

Pl. thyoides differt caule simpliciter pinnato ; foliis longe decurrentibus, margine postico minus dentatis, basi crispulis ; denique præsentia foliolorum. *Pl. montana* (inter *Frondescentes*) elatior est, frondem triangularem sistens ; foliis longioribus magis dentatis, cellulis majoribus.

Obs. Species istæ tres ultimæ foliis basi recurvo-cristatis certe cum *Cristatis* conveniunt, e cæteris caracteribus autem habituque melius forsan inter *Frondescentes* collocavissent.

XXVII. SYZYGIELLA, Spruce.

In Journ. Bot. (1876).

Plantæ elatæ speciosæ cæspitosæ, e flavo-viridi roseæ, rarius purpureo-sanguineæ. *Caules* validi assurgentes parum ramosi, ramis lateralibus, e folii axilla versus angulum posticum ortis, subtus radicellosi, flagellis nullis. *Folia* magna, 3–4^{mm} longa, oblique inserta, succuba, opposita, antice posticeque basi contigua subconnatave, ovato-triangularia, raro suborbiculata, margine antico recurva, basi postica ampliata, apice pro more inæqualiter bidentata, in aliis speciebus autem integra ; vel alia integra, alia oblique unidentata, alia bidentella in una et eadem stirpe. Cellulæ mediocres æquilateræ incrassatæ, trigonis angularibus magnis sæpe intensius coloratis. *Foliola* nulla nisi ad involucrum. *Flores* dioici : ♀ terminales, fertiles innovatione nulla stipati. *Bracteæ* bijugæ, foliis sæpe subbreviores, interiores mediante bracteola bifida in cyathum 10-vel pluri laciniatum, laciniis integerrimis spinulosisve, connatæ.

[*Folia subfloralia* 3–4-juga, cæteris caulinis basi antica latiora altiusque connata, margine sinuata vel obsolete lobulata—anne olim antheridiifera?] *Pistillidia* 20–30. *Perianthia* maxima, ovata, turgida, apicem constrictum versus 4–5—8-vel 10-plicata. *Calyptra* parvula, dimidio infero subincrassata, supero tenuis. *Capsula* alte exserta, maxima, oblongo-globosa, valida, ad basin usque 4-valvis; cætera *Eujungermaniæ*. *Andræcia* medio caule posita; *bracteæ* ♂ foliis caulinis consecutivæ, subminores, paucijugæ; *antheridia* . . . . .

Hab. persæpe arborea, raro terrestris. *Distr.* in montibus Americæ tropicæ, a Mexico et Antillis ad Chili usque; etiam in insula Java.

Syzygiella, habitu, foliis margine antico valide recurvis, basi postica dilatata sæpe recurvo-cristatis, *Plagiochilas* oppositifolias valde refert. Differt caule radicelloso; perianthiis turgidis apice constricto 4-pluriplicatis (neque compressis ancipitibus macrostomis eplicatis ad *Plagiochilæ* instar). Aliæ species pro *Jungermaniis*, aliæ pro *Plagiochilis*, jampridem habendæ fuerunt; sc. *J. J. perfoliata* Sw., *macrocalyx* Mont., *concreta* G. Mex. Leverm. t. 19, *Plag. variegata* Lindenb. Sp. Hep. t. 33, &c.

1. SYZYGIELLA PLAGIOCHILOIDES, Spruce.

Hab. Andes Quitenses, ad rivuli saxa humectata, in monte *Pichincha* (pl. ♀ fertilis); etiam in monte *Tunguragua* et in sylva *Canelos*, ad truncos vetustos necnon in ipsa terra inter Ericeas; alt. 1500–3300^{m}.

F 3·8 × 3·0, 3·3 × 2·8; *c* $\frac{1}{2\,3}$–$\frac{1}{2\,6}$; *per* 6 × 4; *cal* 2·5 × 1·6; *caps* 3 × 2^{mm}.

Elata cæspitosa arcuato-ascendens pendulave, e flavo-viridi rosea purpurascensve; caules 2–4-pollicares, ubique foliosi, ad foliorum bases posticas albido-radicellosi, parce ramosi; rami e foliorum axilla angulum posticum versus orti, fastigiati.

Folia imbricata, distiche patentia vel sæpius decurvo-secunda, opposita, antice posticeque basi brevissime connata, late oblique semicordato-triangularia, apice truncato-bidentata, sinu obtuso acutove, dentibus spini-ciliiformibusve subinæqualibus, cæterum integerrima repandula, margine antico recurvo basi subdecurrente, auriculâ posticâ caulem late transeunte sæpeque recurvo-cristatâ; cellulæ mediocres æquilateræ pellucidæ fere vacuæ, pariete incrassato, trigonis conspicuis.

Flores dioici: ♀ terminales, fertiles innovatione nulla suffulti. Bracteæ bijugæ, foliis breviores latioresque. mediante bracteola parvula in involucrum duplicem, utrumque 10-vel pluri-laciniatum-plicatumque, laciniis integerrimis vel spinoso-subdentatis, alte connatæ, antice tamen liberæ. [Vidi imo bracteam utramque 10-fidam, mediante bracteola 4-fida, in involucrum 24-fidum connatas.] Pistillidia plura, 20–30.—Folia subfloralia 3-juga, cæteris caulinis sensim latiora basique altius connata, conferta, margine antico basin versus præcipue sinuato-denticulata-spinulosave crispatula, postico repanda aliquando basin versus paucidenticulata.

Perianthia alte emersa pallida ovata turgida, apicem obtusatum trunca-

tumve versus 5–8–10-plicata, ore constricto denticulata demum plurifida. Calyptra plus duplo brevior obovato, basin versus pistillidiis 20 vel pluribus obsita, basi ipsa 4 cellulas, paulo altius 2 cell., dimidio supero autem cellulam unicam crassa. Capsula maxima, calyptrâ imo longior eandemque apice cito rumpens, oblongo-rotunda, pedicello tenuiusculo longiusculo suffulta.

Androecia in planta propria, medio caule posita; bracteæ foliis caulinis consecutivæ, minores, paucijugæ, basi erecto-ventricosa arcte imbricatæ, raro dente antico suprabasali auctæ; antheridia (fragmentaria) solitaria videbantur.*

Var. *densifolia* S., foliis confertis prælatis, basi tam antica quam postica altiuscule per paria connatis, apice oblique truncato-uni-bispinosis sæpeve muticis et rotundatis, margine antico late valide recurvis.—In ascensu montis *Tunguragua*, ad truncos.

Var. *subintegra* S., foliis subimbricatis apicem versus sensim angustatis obtusatis subacutisve, raro oblique bidentellis, basi subconnatis; involueris pro more solum 10-fidis.—*Loja*, ad arborum ramos, ubi legit MASSEE.

Obs. The habit of this curious species is so exactly that of a *Plagiochila*, especially when (as is often the case) the leaves are decurva-secund, that before I found the perianths I placed it in that genus. The following species is still more like a *Plagiochila*, and at first sight would unhesitatingly be put along with the "cristatæ." The presence in both species of a tuft of white radicles at the base of each pair of leaves suffices, along with the turgid perianth, 5–10-plicate at the mouth, to place them in a quite different genus, near to *Jung. macrocalyx* Montagne.

2. SYZYGIELLA PECTINIFORMIS, Spruce.

Hab. in sylva *Canelos*, in stillicidiis.

F 3·0 × 1.7; $c\frac{1}{3\cdot2}$-$\frac{1}{2\cdot8}$mm.

Cæspitosa pulchre rosea purpureave; caules 2–3-pollicares simplices furcative, subtus e foliis basi postica ampliatis recurvisque cristati (ad *Plagiochilæ cristatæ* instar).

Folia conferta, pectinatum disticha, in planum patula decurvulave, opposita sed non connata, longe semicordato-triangularia, a basi prælata sensim ad apicem angustum truncato-excisove-bidentatum usque angustata, dentibus brevi-subulato-setaceis, integerrima v. solum repanda angulatave; cellulæ mediocres pellucidæ, trigonis conspicuis sæpe intensius coloratis.—Flores haud inveni.

A *S. plagiochiloide* distincta erit foliis æquilongis duplo autem angustioribus, fere ab ipsa basi ad apicem usque sensim attenuatis, tam longis confertisque ut caules pectinati videantur. Quum autem planta sterilis solum adest, utrumque pro var. præcedentis, utrumque pro specie propria habenda, animo suspensus sum.

XXVIII. TYLIMANTHUS, Mitt.

In Hook. Handb. New-Zeal. Flora (1867); *Gymnanthe*, Tayl. in G. L. et N. Syn. Hep. pro p. (1845); *Jungermania*, Hook. Musc. Exot. t. 16; *Plagiochilæ sp.* auct. nonnull.

* Sub flore perianthifero nulla est innovatio; quando autem flos ♀ infertilis manserit, sub perichætio postice profertur ramulus unus alterusve brevis parvifolius, serius forsitan apice florifer.

Plantæ elatæ, habitu exacte fere *Plagiochilæ*. Caules e caudice valido microphyllo, ramoso et flagellifero, assurgentes erective, subramosi, tortelli, apice decurvi. *Folia* alterna succuba convexo-decurva, raro subexplanata, oblique oblonga, subdimidiata; apice raro rotundata, plerumque emarginato-truncata vel breviter biloba, margine apicali et postico plus minus denticulata serrulatave, antico ad Plagiochilæ instar recurvo et decurrente integerrima, reti majusculo. *Foliola* nulla. *Flores* dioici, terminales. *Bracteæ* ♀ subbijugæ, foliis multo latiores, apice fortius serratæ vel plurilobæ. *Marsupium* (perianthii vicibus fungens) pendulum, in muscis substratis nidulans, carnosum (ore nudum, annulo coroniformi nullo?). *Calyptra* ad apicem fere usque cum marsupio concreta, apice pistillidia sterilia gerens. *Capsula* in peduncula prælongo exserta, cylindrica, 4-valvis. *Elateres* etc. mihi nondum visa. *Andrœcia* spicata, *antheridia* 2–4na ("complura," Tayl.)

Hab. et Distr. Paucæ species adhuc descriptæ in rupibus humidis montium Americæ tropicæ et australis, necnon in insulis Oceanicis: Tasmania, etc. vigent. Species solitaria meipso in Andibus lecta etiam in insulis Antillis inventa fuit.

1. TYLIMANTHUS LAXUS (Lindenb.), Spruce.

Gymnanthe laxa G. in Husnot, Hep. des Antilles. *Plagiochila laxa* Lindenb. Sp. Hep. p. 68, t. 18.

Hab. Andes Quitenses, in stilicidiis subalpinis montium *Pichincha* et *Tunguragua*, etiam in sylva *Canelos*. In insula *Guadaloupe* legerunt cl. HUSNOT aliique.

F 2·0 × 1·3, *c* $\frac{1}{25}$; *br* ♀ 2·0 × 2·3^{mm}.

Cæspitosa, fulvo-virescens. Caules 1–2-pollicares, e caudice prostrato vage diviso microphyllo radicelloso et flagellifero oriundi, assurgentes subramosi, sæpe tortuosi, apice decurvi, subtus hic illic radicellosi; rami foliosi subpostico-laterales, basi vix sub folii angulo postico latentes; flagella autem revera postica.

Folia alterna succuba, plantæ efloriferæ et masculæ subimbricata, fœmineæ confertissima, valde convexo-decurva raro planiuscula, late dimidiato-oblonga vel oblique ovato-oblonga, apice rotundato truncatove, bidentata bilobave (rarius trilobulata), ad sinum parce denticulata serrulatave, margine antico ad *Plagiochilæ* instar recurvo longius decurrentia integerrima, postico brevissime arcuato-decurrentia integerrima vel eroso-repandula; cellulæ majusculæ, omnes equilatero-hexagonæ ad angulos incrassatæ, granulis endochromii paucis magnis in annulum coacervatis subopacæ, basales magis pellucidæ sed non elongatæ. Nonnunquam e folii margine proferuntur radicellæ crebræ capillares implexæ.—Foliola nulla.

Flores dioici: ♀ terminales, innovatione nulla. Bracteæ subbijugæ, foliis æquilongæ, multo latiores, oblato-orbiculatæ, margine inæqualiter sub 5-lobæ, lobulis acutis tortellis, sinubus depressis. Torus

genitalis apice caulis rotundato, pistillidiis sub 20 onusto, constans.

Androecia ovata juliformia, rami apice—raro medio basive—posita; bracteæ pauci- (2–6-) jugæ, arcte imbricatæ, foliis sensim minores, valde ventricosæ, apice lato brevi recurvulo 2–3-dentatæ; antheridia 2–4-na majuscula subglobosa stipitata.

Stirps Husnotiana elatior est, tripollicaris; foliis sparsioribus, apice toto, margine postico supra medium, inæqualiter serrulatis. Cætera conveniunt.

XXIX. SYMPHYOMITRA, Spruce,

in tract. "de *Cephalozia*," (1876: nomen solum).

Genus a *Tylimantho* ægrius dignoscendum, calyptraque eodem modo in marsupio terminali adnata. *Plantæ* autem habitu *Liochlænam* potius quam *Plagiochilam* referunt, caudice repente nullo; caule prostrato radicelloso subflagellifere; foliis linguæformibus integerrimis, margine antico subplano. *Marsupium* subcylindricum, ore squamulis minutis foliaceis biseriatis in annulum duplicem coroniformem connatis circumdatum. *Calyptra* apice libero pistillidiis sub 20 obsita. *Capsula* breviuscule pedicellata, subcylindrica, 4-valvis vel sæpius, duabus valvulis in unam connatis, 3-valvis. *Bracteæ* ♂ foliis caulinis consecutivæ, ventricosæ diandræ.

Hab. et Distr. Unicam speciem mihi hucusque cognitam in Andium subalpinis ad rupes humidas inter muscos legi, m. Aug. 1858.

1. SYMPHYOMITRA GLOSSOPHYLLA, Spruce.

Hab. Andes Quitenses, in rupibus montis *Pichincha* umbrosis humectatis supra pagum *Nono*, alt. 3000^{m}.

F 1·8×·8, 1·25×·9, 1·0×·75; *c* $\frac{1}{16}$–$\frac{1}{30}$; marsupium 2·0×1·0; *br* ·5; cal 1·5; capsulæ valvulæ 1·5^{mm}.

Pallide viridis, tenui strato repens. Caules $\frac{1}{2}$–1-pollicares, tota longitudine foliosi, subtus radicellosi basinque versus flagella radicantia deferentes, cæterum vel simplicissimi vel ramos perpaucos foliosos semiposticos edentes.

Folia succuba alterna, raro per paria subapproximata, patula subplana recurvulave, ovato-linguæformia, subobliqua vix subfalcata, integerrima, caulium fertilium conferta longiora apice rotundata, sterilium breviora sæpe retusa vel obcordato-emarginata; cellulæ majusculæ pellucidæ, oblongo-hexagonæ, trigonis angularibus fulcitæ, minut verruculosæ, parum chlorophyllosæ, folii dimidio postico fere vacu majoresque, marginem versus minores rectangulares, marginales ips quadratæ. Foliola 0.

Flores dioici: ♀ terminales, fertiles innovatione nulla, steriles tamen innovatione postica, suffulti. Folia subfloralia 2–3-juga transversa conferta appressa, cæteris foliis subconformia.

Marsupium foliis parum longius, cylindrico-conoideum, pendulum, inter muscos vicinos radicans, stratis cellularum 6, tenuibus, conflatum, ore squamulis (bracteis) biseriatis tenuissimis ovatis subtrifidis laciniatisve, basi inter se in annulum duplicem connatis, circumdatum. Calyptra $\frac{1}{3}$ brevior pellucida, cellulis æquilateris bistratis constans, cum marsupio alte concreta, apice tamen libera ibidemque pistillidiis sterilibus sub 20 coronata. Pedunculus semuncialis. Capsula oblongo-cylindrica, ad basin usque fissa, valvulis (sæpius solum 3) linearibus planis rectis.

Andrœcia in caulis apice mediove posita; bracteæ foliis consecutivæ, paulo breviores, paucijugæ, antice a basi ad medium usque incurvæ, ventricosæ, diandræ.

Var. *latifolia*, humilior, $\frac{1}{8}$-pollicaris, amœne viridis, ramum unum alterumve e folii angulo infero, necnon flagella postica proferens. Folia latiora ($1{\cdot}5 \times 1{\cdot}25^{mm}$) apice rotundata, nunquam retusa, magis opaca. Calyptra a marsupio interdum separabilis, apicem autem pistillidia gerentia idem ac in typo.—*Tunguragua*, ad terram in umbrosis.

XXX. LIOCHLÆNA, Nees.

In G. L. et N. Syn. Hep. 150 (1845). *Jungermania* auct.

Caules prostrati, radicellis longissimis pallidis vel rubellis villosi, parum (e latere) ramosi, raro flagelliferi, in plagas latas intricati. *Folia* ovato-oblonga, sublingulata, apice rotundata retusulave, rarissime subemarginata, decurvula, basi antica breviter decurrente levissime recurva, reti laxiusculo subopaco. *Foliola* nulla. *Flores* dioici vel paroici: ♀ terminales, innovatione sæpius suffulti. *Bracteæ* 1–2-jugæ, foliis latiores, cæterum subconformes. *Pistillidia* 5–12. *Perianthium* primum pyriforme, maturum cylindricum, incurvum, omnino eplicatum, apice abrupte rotundato constrictum, ore minuto prominulo ciliolato. *Capsula* alte exserta, oblonga, 4-valvis bistrata; cellulæ exteriores pariete trabeculato, interiores fibras semiannulares includentes. *Elateres* dispiri. *Sporæ* globosæ minutæ, elateribus æquilatæ. *Andrœcia* solum in *L. lanceolata* hucusque observata; bracteæ ♂ hypogynæ, foliis conformes, basi antica turgescente antheridia 2–4na foventes.

Hab. et Distr. Species solitaria, *L. lanceolata* (Huds.) N.,* antea cognita, per Europam late dispersa, paroica est; duas novas, dioicas, hic descriptas, in Andibus orientalibus sylvaticis ipse legi.—Genus forsan a *Jungermania* haud rite separandum, habitu autem peculiari et perianthio cylindrico siphonioideo ab omnibus *Jungermaniis* integrifoliis facile dignoscendum.

1. *L. lætevirens.* Recens viridissima, flagellis nullis. F. oblique inserta, ovato-ligulata, subfalcata.

* Spruce in Eng. Bot. Suppl. t. 2947.

2. *L. picta.* Flagellifera, ex albido-viridi rufescens, rigidula. F. conferta, fere transversa, breviora et latiora, oblique ovato-oblonga, cellulis ad angulos magis incrassatis.

1. LIOCHLÆNA LÆTEVIRENS, Spruce.

Hab. Andes Quitenses, in valle fl. *Pastasa* superioris, alt. 1500^{m}, in terra supra vimina foliaque emortua humectata repens.

F 3·5 × 2·1, 1·8 × 1·2; *c. mediæ* $\frac{1}{16}$, *apicales* $\frac{1}{35}$; *per* 2·0–3·0^{mm}.

Læte viridis siccando vix decolora, prostrata laxe implexa; caules 1–1½-pollicares radicellis rufo-ferrugineis repens, ramos paucos e foliorum axilla edens, flagellis tamen nullis. Radicellæ longæ ad lineam mediam posticam per totam fere caulis longitudinem insertæ, necnon e foliorum basi ipsa progredientes.

Folia majuscula distiche patula, decurvula late (ad$\frac{1}{3}$–$\frac{1}{2}$) imbricata subfalcata ovato-oblonga-ligulatave, apice angustiusculo rotundata raro retusula, basi antica subdecurrentia; cellulæ majusculæ chlorophyllosæ longe hexagonæ, mediæ fere quadratæ parallelogrammæve, ad angulos minute incrassatæ, granis endochromii magnis angularibus cellulæ medio ambituve coacervatis repletæ. (Folia dimidio longiora quam lata.)

Foliolo 0.

Flores *dioici:* ♀ terminales, innovatione suffulti; bracteæ foliis paulo latiores subinvolutæ apice retusæ v. inæqualiter emarginatæ; bracteola 0.

Perianthia arcuato-assurgentia, juniora pyriformia, matura foliis subæquilonga cylindracea, ore constricto ciliolata.

L. lanceoluta (Linn.) colore sæpius olivaceo-viridi lurido, foliis latioribus, florescentia paroica, et perianthio alte emerso differt.

2. LIOCHLÆNA PICTA, Spruce.

Hab. In umbrosis montis *Tunguragua*, alt. 2000^{m}, ad saxa terra obtecta.

F 2·0 × 1·65, 2·3 × 1·6, 2·3 × 1·8; *c. med. inf.* $\frac{1}{16}$—$\frac{1}{25}$, *marg.* $\frac{1}{40}$; *per* (juv.) 1·0 × 0·4^{mm}.

Plantæ parvulæ, albo-virides hic illic rufescentes, rigidulæ, fragiles tamen et opacæ. Caules ½-pollicares prostrati, simplices v. parum ramosi, radicellis longis rubellis subtus villosi, basin versus flagellum radicelliferum unum alterumve proferentes, apice assurgentes (siccando sæpe circinati).

Folia majuscula alterna, insertione fere transversa, antice subdecurrentia, distiche patula, arcte imbricata (ultra ½ lat.), plus minus concava, apice decurvula, suboblique late ovato-oblonga, rotundata retusulave raro emarginata, margine repanda integerrima; cellulæ mediæ inferioresque majusculæ oblongo-6-gonæ sinuatæ, apicales marginalesque minores subæquilateræ, omnes valde chlorophyllosæ (paucæ basin versus insigniter opacæ) ad angulos sat incrassatæ.

Foliola nulla.

Flores dioici: ♀ terminales, innovatione vix unquam suffulti. Bracteæ foliis paulo latiores, magis concavæ, emarginatæ, 1–2-jugæ.

Perianthium (juvenile) duplo brevius, pyriforme cylindraceumve explicatum, apice constricto subfimbriatum, hinc tota fere longitudine hians, pistillidia sub 12 includens.

XXXI. JUNGERMANIA, Rupp. Linn.

Plantæ humiliores, rarius elatæ. *Caules* in planum simplices furcative, in paucis iteratim dichotomi, in plerisque vage ramosi, ramos (paucos) laterales ex angulo foliorum postico proferentes; rami revera postici nulli vel rarissimi, flagellares autem radicantes aliis speciebus adsunt. *Radicellæ* plerumque pallidæ, in speciebus habitu prostrato copiosæ, in cæpitoso-erectis (præter ad basin) sparsæ vel subnullæ. *Folia* succuba, raro subtransversa, patentia, assurgentia, vel lateraliter accumbentia, sat lata, in aliis sp. integra, aliis biloba, aliis paucis 3–5-loba-dentatave; margine plano vel incurvo, nunquam recurvo, semper fere integerrimo raro denticulato; reti mediocri, vix unquam laxo, raro minuto. *Foliola* plerisque sp. carentia; quibus adsunt pro m. parva, integra bifidave, raro subquadrifida. *Flores* dioici vel paroici: ♀ terminales, fertiles raro innovati, steriles sæpe innovatione subflorali suffulti. *Bracteæ* raro plus quam bijugæ, foliis subconformes vel magis incisæ, a perianthio liberæ, inter se interdum connatæ. *Pistillidia* plura (8–70). *Perianthia* plerumque emersa, a latere compressula, vel teretia, in perpaucis a fronte subcompressa, raro omnino ecarinata, semper fere (superne saltem) carinis 3–10—lævibus, rarius asperis, nunquam alatis—precursa; ore pro m. parvo, integerrimo vel denticulato, raro ciliato, quandoque tubulari, interdum primum clauso demum valvatim rupto; rarissime uno solo latere hiantia. *Calyptra* pyriformis ovalisve, tenuis, vel solum in ipsa basi carnosula, a pistillidiis sterilibus libera. Capsula alte—raro breviter—exserta, globosa vel oblonga, raro cylindracea, 2–5-strata, 4-valvis, valvulis raro bifidis. *Elateres* dispiri. Sporæ minutulæ, læves vel scabernlæ.

Hab. et Distr. In terra saxisque humidis umbrosis necnon in truncis putridis; in arboribus vetustis rarius, in cortice foliisque vivis nunquam (quantum scio). *Jungermaniæ* in zonis temperatis longe frequentiores, in zona torrida vix extra montes vigent. In planitie Amazonica speciem solitariam semel inveni; in Andibus species 9 nullibi copiose carpsi.

Obs. Notwithstanding the amount of splitting and paring down which the genus *Jungermania* has undergone, what remains of it under that designation is still a somewhat incongruous assemblage of species. If the plants with roundish entire leaves be regarded the typical form, the cloven-leaved species may stand apart under Dumortier's name, *Lophozia*, but only as a subgenus, for there is no constant peculiarity of the floral organs and fruit to support the solitary character derived from the leaves, and that character also fades away in such species as *J. heteracria*, which combines bifid with entire leaves on the same individual.

Of some splits from *Eujungermania*, as distinct genera, or to be tacked on to previously separated genera, it may perhaps be asserted that they sever what nature never meant to be put asunder. Thus the *Eucalyx* of the excellent Lindberg, removed by him from *Jungermania* to be attached to *Nardia*, is plainly more nearly related to certain undisputed *Jungermaniæ* than to *Nardia scalaris* and its genuine allies. The adhesion of the ♀ bracts to the base of the perianth, which is held to justify this transposition, is often very slight and variable in *Eucalyx*, and in some forms of *E. crenulata* (Sm.) it disappears altogether.

In *Solenostana*, as originally proposed by Mitten, the tubular mouth of the peristome is the sole character assigned to distinguish the genus from *Jungermania*. If that be so, then we have an exquisite example of it in *J. sphærocarpa* Hook. (=*J. lurida* Dum. =*J. nana* Nees. =*J. Goulardi* Husn.). In a large series of specimens of *J. sphærocarpa* now before me I note that the fully-formed but still unruptured perianth is constantly narrowed into a short apical tube, and that when ruptured by the ripe fruit it is almost as constantly regularly 4-cleft. The perianth of *J. crenulata* has rarely any approach to a tubular mouth; but in that of *J. gracillima* (or *Genthiana*), which is scarcely more than a subspecies of *J. crenulata*, I often find a shortly-tubular mouth. The perianth is often far more distinctly beaked in *J. J. Bantriensis*, *Hornschuchiana*, and some other species, whose affinity to the original *Solenostoma* is very remote indeed. The author afterwards added on to the generic character "involucral leaves adnate to base of perianth," which would make it partly coincide with *Eucalyx;* but, as it at present stands defined, it does not really represent any natural group of species.

Jamesoniella, proposed by myself in 1876 as a subgenus, can only be regarded as a section of *Jungermania* proper. Whether the British *Jung. Carringtonia* Balf. be really a congener of *Jamesoniella colorata* (the typical species) is doubtful, and will probably remain so until fertile plants of the former be found.

Lindberg's subgenus *Sphenolobus* seems distinct so long as we look only at *Jung. minuta* and other typical species; yet it passes insensibly into *Lophozia*. The curious little plants I describe here under the sectional name *Cephaloziopsis*, might perhaps be united to Sphenolobus, but their habit is quite peculiar. The species I have called *Jung. achroa* is unique in its mode of branching, having some branches lateral, some postical, and others *antical*—springing from the *upper* face of the stem. The lateral branches are rarely axillary, but arise a little above the inner base of the adjacent leaf. (A similar supra-axillary branching is sometimes seen in *Diplophyllum Dicksoni*.) The somewhat complicate, and often toothed, leaves of *J. achroa*, and especially the presence of postical leaves (or bracteoles) in the involucre, although there are none on the stem, approximate the species to such *Cephaloziæ* as *C. dentata* and *C. Turneri*, near which I at one time collocated it.*

* When my memoir on *Cephalozia* appeared (Sept. 1882) I had seen only sterile specimens of the remarkable *Jung. phyllacantha* Mass., and misled by the obvious resemblance of its tristichous toothed leaves to those of *Anthelia*, I rashly referred it to that genus. The last sheet had barely left the printer's hands when I received from Professor Massalongo fertile specimens of his plant, showing unmistakably that as to the perianth, calyptra, &c. it was a true *Cephalozia*, allied to *C. dentata* and *C. Turneri*, but, like them, having only lateral, and no postical branches; in which particular they all differed from the typical postical ramification of *Cephalozia*. Thereupon I reviewed all my materials,

Anastrophyllum nob. is a very distinct group, and might take rank as a separate genus, were it not for the existence of *J. Reichardti* and one or two other species, which bridge over the gap between it and *Lophozia*.

Subgenus I. *EUJUNGERMANIA*.

Aplozia Dum. Syll. et Hep. Eur.

Folia orbiculata vel ovata, integra, interdum retusa, raro alia integra alia emarginata. *Foliola* vel sæpissime nulla vel ubi adsunt perparva.

§ 1. *Caules determinati. F. succuba. Per superne saltem angulis* 3–5 (*rarissime* 6 *vel* 7) *percursa.*

1. *J. cordifolia*, var. *longifolia*. Dioica, elata, suberecta, dichotoma. F. laxe convolutiva, a basi subcordatâ ovato-linguæformia obtusata, c. majusculis oblongis. [Per. ovali-fusiformia acuta compressula, solum apice obscure plicata.]
2. *J. amœna*. Dioica pusilla prostrata. F. ovali-rotunda caviuscula sursum increscentia, c. parvulis æquilateris. Per. oblonga 3-(raro 4-) plicata, ore constricto integerrima.

§ 2. (JAMESONIELLA nob. in Journ. Bot. 1876). *Caules elati, apice pro m. circinato indefinite evoluti. F.* (*nisi pro basi antica decurrente*) *transversa, lateraliter accumbentia. Per. alte* 6–10-*plicata.*

3. *J. colorata*. Caules nudi. F. densa suborbiculata concava, cellulis ad angulos insigniter incrassatis. Br^la^ bracteis utrinque connata. Per. oblonga, 6–10-plicata, ore brevilobulata erosulaque.
4. *J. grandiflora*. Caules squamulis subulatis conspersi. F. obovato-rotunda, margine antico valide incurva, cell. ad angulos parum incrassatis. Br^la^ libera. Per. alte emersa ovato-subulata 6-plicata.

1. JUNGERMANIA CORDIFOLIA, Hook.

Brit. Jung. t. 32.

Hab. Andes Quitenses, in cataractæ arena montis *Pichincha*, alt. 4000^m^, sterilis. In tota Europa sat vulgata rarissime fertilis.

F 2·15 × 1·5 ; *c* $\frac{1}{24}$^mm^.

Var. *longifolia*. Cæspitosa lurido-viridis. Caules 2–4-pollicares, erecti vel arcuati, arhizi, basi subaphylli, superne laxe foliosi, supra medium 2–4-ies dichotomi, ramis fastigiatis parallelis, flagellis posticis nullis. Folia subimbricata, a basi subcordatâ obliquâ convolutivo-semiamplexicaulia, subsecunda, ovato-linguæformia obtusata rotundatave—rarius solum obtusa vel etiam subacuta ; cellulæ majusculæ subelongatæ fere vacuæ. Foliola nulla.

Obs. In the slowness with which this plant recovers its form, when moistened after drying, and in the subsecund elongated foliage, it approaches a Scottish form of *J. cordifolia*, gathered by the late T. Drummond. Plants gathered in deep springs in the Pyrenees have similar dichotomous stems ; but the leaves are broader, and nearer the form represented by Hooker (Brit. Jung. t. 32).

and I concluded to retain those species and *C. asperifolia* Tayl. as a subgenus apart from *Cephaloziella*, which should bear the name PRIONOLOBUS. It would perhaps be more convenient, and equally correct, to regard them as a distinct genus, into which might enter the *Jung. achroa* here described.

Jung. cordifolia belongs to a small section of the genus which we may call § *Luridæ*, consisting of 3 European species, *J. J. pumila, riparia* and *cordifolia*, all common in Britain, and all notable for the olive-green colour of the ovate-oblong, or somewhat heart-shaped leaves; for the dichotomous, or lateral branching (with the addition of postical flagella in *J. riparia*); but especially for the perianth being compressed frontally instead of laterally, and having a furrow in place of a raised keel along the middle of the upper face. In *J. pumila* (which is paroicous, while the other two are dioicous), the perianth is fusiform, with a minute edentate orifice at the acute apex, beneath impressed (until inflated by the ripe capsule) with no evident folds, above obtusely 2-plicate with a narrow furrow between the folds; this furrow is at the suture of the flower-leaves, and is eventually ruptured by the protrusion of the fruit. The perianth of *J. cordifolia* also is fusiform and acute, but less compressed (more nearly circular on the section), and only near the apex slightly plicate. In *J. riparia* the frontal compression is slight, but perceptible; the mediantical furrow strongly marked, and bordered by two pronounced keels, or folds; while beneath it has (at least) one broad prominent keel, making (with the marginal keels) the perianth strongly 5-carinate. By the duplication of the postical keel, and sometimes of one or more of the other keels, the perianth may become 6–8-carinate, especially in the upper half.

2. JUNGERMANIA AMŒNA, L. et G.

Syn. Hep. 674; Gottsche Mex. Leverm. 86 (cum icone).

Hab. Andes Peruvianos, in declivibus umbrosis montis *Campana*, alt. 1200^{m}, socio *Odontoschismate denudato;* Andes Quitenses, in monte *Altar*, alt. 2500^{m}, forma pusilla, sociis *Noteroclada, Calypogeia*, etc.

F ·5 × ·4, ·3 × ·3; *c* $\frac{1}{40}$—$\frac{1}{36}$; *per* 1·0 × ·6, ·9 × ·55, ·7 × ·4^{mm}.

Pusilla pallide viridis prostrata. Caules 3–6^{mm} longi subramosi, tota longitudine pallide radicellosi, eflagelliferi.

Folia imbricata caviuscula—ramorum sterilium subplana—ovali-rotunda orbiculatave integerrima, alia obscure marginata, inferiora sensim minora; cellulæ parvulæ æquilateræ leptodermes, endochromio parco granuloso. Foliola 0.

Flores dioici: ♀ terminales, sine innovatione. Bracteæ paulo latiores quam longæ, subconvolutivæ, cæterum foliis conformes; bracteola vel parva ligulata vel sæpissime nulla.

Perianthia foliis 2–3plo longiora, rosea, oblonga vel brevi-cylindracea—pleraque superne obtuse triplicata, plicâ tertiâ anteriore, pauca 4-plicata, plicâ quartâ posticâ—ore constricto subintegerrima demum fissa. Capsula late ovalis.

Obs. J. amœna is said in 'Syn. Hep.' to have "surculi gemmipari trifariam foliati"; but these shoots must surely have belonged to an intermixed *Odontoschisma;* for it is singular that the Peruvian *J. amœna* grows along with *Odont. denudatum*, which bears precisely the same sort of gemmiparous trifarious-leaved shoots as in the Mexican plant are (wrongly) attributed to *J. amœna.*—The latter is almost a miniature copy of the European *J. lurida* Dum. (=*J. nana* Nees), differing in its slightly narrower leaves and oval capsule.

3. JUNGERMANIA COLORATA, Lehm.

Jung. colorata, Lehm. in Linnæa iv., 366 ; G. L. et N. Syn. Hep., 86 et 673. *Jung.* (*Jamesoniella*) *colorata*, Spruce in Journ. Bot. (1876).

Hab. in monte *Tunguragua*, alt. 2500^{m}., ad terram sub Ericearum umbra, foliis fruticulorum decisis marcidis radicata, sterilis. Per Andium juga, a Mexico ad Caput Horn usque ; necnon in tota zona temperata australi, hic illic inventa est.

F 1·0 × 1·0, 1·2 × 1·4 ; *c* $\frac{1}{35}$; *br* 1·05 ; *per* 1·3 × ·8^{mm}.

Elata specioso dense late cæspitosa, e fulvo rosea, inferne badia. Caules 6–10 cm. longi, vel altiores, a basi decumbente, nudâ v. denudatâ, parce flagelliferâ erecti, subflexuosi, apice stricto decurvulove indefinite crescentes, polyphylli, simplices v. pauciramei, ramis fastigiatis axillaribus—e foliorum angulo postico, nec e caule extra foliorum bases, orti—nudi (haud squamulosi) perraro radicellosi. Flagella, ubi rarius adsunt, postico-lateralia breviuscula, valida, foliis rudimentariis radicellisque tenuibus albidis sparsa.

Folia dense imbricata, decurvo-secundo, caulis faciem posticam latius quam anticam transeuntia, suborbiculata, incurvo-concava, toto margine cum contrariis fere contigua, insertione subtransversa, basi antica sensim, postica abrupte breviuscule decurrentia, integerrima, substantia crassa, fragilia, punctato-areolata ; cellulæ mediocres, valde incrassatæ, trigonis maximis subopacis, facie interna 6-sinuatæ, endochromio parcissimo, cuticula pulchre crebreque verruculosa.

Foliola pauca versus caules apicem (nec semper) inveniuntur : foliis multoties minora, perangusta, subulata acuminata.

Flores dioici : ♂ terminales, innovatione unilaterali—raro duabus oppositis—suffulti. Bracteæ propriæ unijugæ, foliis subæquilongæ, dilatatæ et cum bracteola intermedia 2–4-fida in membranan plurilaciniatam, laciniis subulatis flexuosis sæpe ruptis, alte connatæ, antice tamen liberæ basinque versus ciliis sub 3 deversis armatæ. Folia subfloralia, bracteis proxime sequentia, varie sinuato-lobulata, alterna tamen, foliolo subulato trifido uno solo illorum connato.

Perianthia bracteas paulo superantia, oblonga, profunde 6–10-plicata, ore parum constricto brevi-lobulata erosulaque. Cætera haud visa.

Var. *elatior* : tota rosea, 15–20 cm. longa. Folia fragilissima, basi utrinque fere æqualiter decurrentia, sicuti potius obovato-orbiculata subspatulata appellanda, minus concava, margine intensius colorato repanda, interdum apice subretusa.

J. colorata, insulis Falklandicis ab Hookero f. lecta, iisdem duabus formis constat. Aliæ formæ ab eodem detectæ sunt : 1. *minor* fere nigra, ad Cap. Horn ; 2. *nigrescens*, magis flagellifera, foliis valde homomallis.

4. JUNGERMANIA GRANDIFLORA,

Lindenb. et G. Syn. Heb., 673. Spruce in Journ. Bot. (1876).

Hab. in montis Tunguragua regione sylvatica, ad terram sub fruticulorum umbra sæpe *J. colorata* consociata. Eandem speciem legit beat. Jameson in m. Pichincha ; antequam in Chili a Cl. Gay inventa fuit.

F 1·0 × ·9, 1·3 × 1·1 ; *c.* $\frac{1}{35}$; *br* 2·0 *longæ* ; *br*^{la} 1·05 × ·5 ; *per* 3·5 × 1·0^{mm}.

Laxe cæspitosa, badia, apice subrosea. Caules 8 cm. longi, a basi (rhizo-

mate) tenui prostrata flexuosa denudata subdivisa flagellifera assurgentes, flexuosi, apice decurvo-circinati, subsimplices, raro ramum unum alterumve proferentes, fere arhizi, squamulis tamen minutis subulatis setaceisve arcte articulatis sparse densiusve obsessi.

Flagella postico-lateralia, subaphylla, radicellifera, e rhizomate orta; raro e medio caule proveniunt alia stoloniformia microphylla arhiza.

Folia minus arcte imbricata, subpatentia, transversa, decurvo-secunda, oblique obovato-rotunda, apice incurvula, margine antico toto valide incurva, basi longe decurrentia, postico plana, rotundata, basi multo brevius decurrentia, integerrima. Cellulæ mediocres, læves v. obscurissime verruculosæ, parum incrassatæ, intus ovali-5–6-gonæ, endochromio parco annulari. Foliola nulla vidi.

Flores dioici: ♀ terminales, innovatione brevi (sæpe bifida) suffulti. Bracteæ unijugæ, foliis sublongiores, ovato-lanceolatæ, varie laciniatæ: bracteola duplo brevior, libera, ovato-lanceolata subacuminata, medio margine utrinque 1-dentata-lobulatave.

Perianthia alte emersa, foliis triplo longiora, ovato-subulata obtusa, alte 6-plicata, plicis 2 anticis obtusioribus, omnibus obliquis subspiralibus, ore subdenticulata. Cætera desunt.

Andrœcia medio caule posita; bracteæ plurijugæ, foliis consecutivæ, iisdem vix breviores, antice lobulo angusto tota longitudine cum bractea connato, margine incurvo spinis 1–3 armato, auctæ. Antheridia non aderant.

Subgenus II. *LOPHOZIA*, Dum.

Syll. et Recueil; *Jungermania* ejusd. Hep. Eur.

Folia suborbiculata vel subquadrata, bifida, in paucis 3–5-fida, integerrima vel interdum denticulata. *Foliola* vel nulla vel parvula et plerumque bipartita. Perianthia plerumque valide plicata, rarissime cylindrica lævissima.

§ 1. *Eulophozia.* Plantæ humiles elatioresve, sat grandifoliæ, habitu *J. J. ventricosæ* et *Bantriensis* floræ nostræ.

5. *J. heteracria.* Dioica, caule brevi prostrato, apice assurgente, pauci-rameo. F. imbricata orbiculato-quadrata, apice varia, retusa, emarginata, vel breviter 2–3-fida, raro obtusata. F^{la} 3plo breviora, angusta, bipartita, segmentis subulatis. Br. prælatæ concavæ breviter 2–3-fidæ, segmentis cuspidatis. Per. emersa obconico-oblonga teretia, superne obtuse triplicata, ore longiciliato.

6. *J. subinflata.* Dioica, humilis, subsimplex, a basi prostrata erecta. F. subimbricata, sursum crescentia, semicordato-ovato-rotunda, concava, ad ¼ obtuse biloba, lobis subacutis. F^{la} 0. Br. foliis submajores, altera interdum triloba; br^{la} sæpius interjecta. Per. oblonga, inferne turgida, superne 6-plicata, ore constricto longiciliata.

§ 2. *Cephaloziopsis. Plantæ* pusillæ minutifoliæ, facie *Cephaloziæ*, ramificatione autem diversa, perianthiisque, ubi solum trigonis, angulo tertio antico. F^{la} normaliter nulla. Fl. ♂ monandri.

7. *J. schistophila.* Dioica, minuta pellucida tenerrima, caule a basi prostrata assurgente simplice furcatove, interdum ramum posticum unum alterumve proferente. F. distiche patula, a basi angustâ obovato-cuneata, vix ad ½ bifida, segmentis obtusatis, cellulis parvulis. F^{la} 0

Br. laxæ obovato-orbiculatæ, breviter bilobæ, br^{la} 0. Per. alte emersa linearia superne compressula 3-carinata.

8. *J. opacula.* Dioica pusilla luride viridis tenerrima, caule plerumque dichotomo. F. dissita patentia cuneato-orbiculata ad ½ bifida, segmentis ovatis obtusis, c. minutis opacis.

9. *J. achroa.* Pusilla subscariosa, caule elongato arcuato ramoso, ramis plerisque lateralibus, aliis autem *anticis*, aliis (subaphyllis) posticis. F. cuneato-ovalia, laxe complicata, ad ½ bifida, segmentis acuminulatis repandis rarius serrulatis, antico duplo angustiore, c. mediocribus oblongis subvacuis. Br. tristichæ subtrijugæ, intimæ f. duplo majores, recurvantes, subrotundæ, ad ½ bifidæ, spinosæ; br^{la} quadrato-oblonga spinulosa integra bifidave. Per. pyriformi-oblonga, 4–5-plicata, ore plurilaciniata, laciniis spinulosis.

5. JUNGERMANIA HETERACRIA, Spruce.

Hab. Andes Peruvianos circa *Tarapoto*, alt 500–800^{m}, in aggeribus arenosis; necnon in fluvii *Negro* ripis juxta limites inter Brasiliam et Venezuelam.

F 1·0 × 1·0; *c* $\frac{1}{30}$; *f*^{la} ·25–·4; *per* 2·0; *caps* 0·5^{mm}.

Depresso-cæspitosa, pallide viridis albidave, interdum roseo picta. *Caules* semipollicares, prostrati, radicellis pallidis solo adfixi, apice assurgentes, simplices vel stolonibus parum ramosi.

Folia basi lata diagonali inserta, imbricata, assurgentia, caulium sterilium magis patentia, orbiculato-quadrata, retusa emarginatave, vel persæpe breviter bifida, sinu acuto obtusove, segmentis pro more rotundatis, rarissime tridentata vel perfecte integra et obtusata; cellulæ mediocres æquilateræ leptodermes pellucidæ, chlorophyllo parco, marginales quadratæ. Folia stolonum et innovationum minora, sæpe acute bidentata.

Foliola foliis subtriplo breviora, angusta, ad basin fere usque bipartita, cruribus suberectis patulisve subulatis, basi 2 cellulas, apice 1 c. latis, interdum basi dente hinc v. utrinque aucta.

Flores dioici: ♀ terminales, radicellis prælongis basi villosi, fertiles innovatione nulla suffulti, steriles nonnunquam innovati. Bracteæ 1-jugæ, foliis paulo majores, latiores quam longæ, concavæ, breviter 2–3-fidæ, segmentis sæpe cuspidatis; bracteola (intra bracteas) sæpissime nulla, quando autem adest ligulato-oblonga, apice truncato digitatim 4-fida-ciliatave. Foliolum infraflorale cæteris paulo majus, conforme, cruribus subulatis acuminatis basi 4 c. latis.

Perianthia foliis duplo longiora, juniora campanulata, ore hiante profunde laciniata ciliataque, matura obconico-oblonga, inferne teretia, superne obtuse triplicata, ore longiciliata demum rupta. Calyptra duplo brevior pyriformis. Capsula calyptrâ duplo brevior ovali-oblonga.

Var. *Peruviana*, albicans, ramis brevibus fastigiatis densius cæspitosa. Folia sæpius integra, rotundata retusave, raro adveniunt etiam bifida.—*Lamas*, prope *Tarapoto*, in rivuli arena.

Var. *Amazonica*, foliis plerisque profunde obtuse emarginatis, foliolis autem bipartitis et perianthiis ore ciliatis, ibidem ac in typo. Stolones tam attenuati, folia tam angusta et bifida sunt ut melius pro *Cephalozia* quadam primo visu plantula deprehendatur.—*Marabitanas.*

Notoscyphus Belangerianus (L. et L.) Mitt.; *Gymnomitrium B.* Syn. Hep.; quoad folia apice varia, foliola profunde bifida, segmentis erectis,

et involucrum ♀ e caule prostrato abrupte erectum, basi valde radicellosum, *J. heteracriæ* sat similis; perianthium verum tamen abest, ejus loco invenimus bracteas 2 magnas erectas, alte inter se connatas et cum bracteola interna tenerrima dimidio inferiore adnatas.

J. heteracria forsan prope *J. J. Kunzei* et *Hornschuchii* collocanda; foliis autem nunc integris nunc apice bifidis &c., et perianthio ore ciliato plus minus hiante ab omnibus distat.

6. JUNGERMANIA SUBINFLATA, Spruce.

Hab. Andes Quitenses, in rupibus aggeribusque montium *Tunguragua*, Guayrapata, &c., alt. 2400–3000^{m}.

F ·6×·6, ·8×·8; *c* $\frac{1}{40}$; *per* 1·6×·65^{mm}.

Cæspites lati densi e flavo virides, apice rufescentes. Caules 1–1½^{cm} alti, basi brevi prostratâ subnudâ flagella aphylla radicellifera deferentes, dein erecti flexuosi simplices vel bi-trifidi.

Folia subimbricata, infima minuta, superiora sensim majora, lateraliter patentia, caulium fertilium erectiora accumbentia, magis increscentia, ovato-rotunda complicato-concava, basi antica breviter decurrentia, postica semicordata, apice ad ¼ usque bifida, laciniis subæqualibus vel antica minore—acutis subobtusisve, conniventibus, sinu triangulari obtuso; cellulæ parvulæ æquilateræ, ad angulos subincrassatæ, marginales subquadratæ. Foliola nulla.

Flores dioici; ♀ terminales, sine innovatione; bracteæ 1-jugæ, foliis submajores, appressæ, cæterum conformes, vel altera trifida; bracteola (raro deficiens) bracteis 2–3plo minor, raro æquilonga, ovata ovalisve obtusata, plerumque cum altera bractea altiuscule connata.

Perianthia emersa oblonga, plus duplo longiora quam lata, inferne turgida lævia, superne obtuse sub 5-plicata, ore constricto subdenticulata. Capsula oblonga.

Andrœcia medio caule posita; bracteæ plurijugæ, foliis caulinis continuæ paulo minores, confertiusculæ.

J. conformis L. et G. (Syn. Hep. 665, G. in Mex. Leverm. 81) certe differt caule elatiore magis ramoso; foliis ad ⅓ bifidis, segmentis ovato-lanceolatis apiculatis. *J. adulterina* G. in Hep. Novogranat. 23, caule sub perianthio semper innovato, foliis ultra ⅓ bifidis, &c. magis distare videtur. *J. inflata*, Huds., Europæa, nostram habitu sat refert, caractere longe diversa.

7. JUNGERMANIA SCHISTOPHILA, Spruce.

In Andibus Peruvianis prope *Tarapoto*, alt. 600^{m}, in rivuli rupibus humidis schistosis fragilibus (Triassicis).

F ·2×·1, ·4×·25; *c* $\frac{1}{15}$; *br* ·4–·5; *per* ·8×·2, 1·0×·25; *caps. valv.* ·25×·05^{mm}.

Minuta depresso-cæspitosa pallide viridis pellucida tenerrima. Caules 6^{mm} longi, tenues, basi breviter prostrati subramosi radicelliferi sed fere aphylli, dein assurgentes foliosi et fere arhizi, simplices vel ramum unum alterumve e facie postica proferentes, interdum furcati.

Folia distiche patula plana oblique inserta alterna, caulium sterilium subdissita æquimagna, fertilium contigua vel subimbricata, superiora sensim increscentia et magis transversa, a basi angustâ obovato-cuneata vix ad medium usque bifida, sinu subacuto, segmentis subinæqua-

libus obtusatis, a basi ad sinum usque 8 cellulas longa, medio 8–10c. lata, segmentis 4–6c. longis, 4–5c. basi latis ; cellulæ parvulæ parum elongatæ leptodermes fere vacuæ, marginales vix convexulæ, totæ cellulæ cujusque folii circiter 120.

Foliola nulla, nec ad involucrum.

Flores dioici (?): ♀ terminales, innovatione simplice nullave suffulti, interdum basi radicellosi. Bracteæ foliis submajores laxæ orbiculato-quadratæ, breviter bilobæ, lobis acutis obtusisve, postico majore.

Perianthia alte emersa, bracteas duplo superantia, 4plo longiora quam lata, linearia, basi sensim angustata ibidemque compresso-teretia, superne tamen sat compressa, obtuse tricarinata, carinâ tertiâ *anticâ*, postice plana convexulave, raro obscure bicarinulata, ore subintegerrima.

Planta perpusilla tenerrima facie *Cephaloziæ* fere gaudet, differt autem generice perianthio *antice* (nec postice) carinato et bracteolarum defectu, necnon flore fœmineo constanter acrogeno, innovatione interdum suffulto. Solum minutie ab Eujungermaniis remota, quin etiam inter has perianthium aliquando solum trigonum invenitur, angulo tertio *antico*, e.g. in *J. amœna J. obovata*, etc.—*J. Doellingerii* Nees, Syn. Hep. 104, in Brasilia ad arbores lecta, nostræ ob exilitatem et folia obtusiloba certe proxima, perianthia habet ovali-campanulata, ore aperto repando-lobata (probabiliter rupta).

Ad *Antombos* Andium Quitensium, in stillicidiis micaceo-schistosis, advenit plantula tenerrima, priori simillima quoad foliorum formam, caule tamen semper dichotomo diversa. Sterilis et eflorifera est, foliis laxis distantibus.

8. JUNGERMANIA OPACULA, Spruce.

Hab. Guano, Andium Quitensium, alt. 2600^{m}, ad rupes terra obtectas, sterilis.

F ·2 × ·2, ·3 × ·3, ·3 × ·35 : *c* $\frac{1}{10}$–$\frac{1}{60}$^{mm}.

Pusilla diffusa luride viridis tenerrima. Caules 6^{mm} longi, parce divisi, semel bisve furcati vel subpinnati, ramis omnibus lateralibus ; basi subaphylla sola radicellosi, flagellis nullis.

Folia dissita patentia cuneato-orbiculata, ad medium usque bifida, obscure carinata, fere plana, lobis ovatis obtusis subdivergentibus ; cellulæ minutæ æquilateræ leptodermes, chlorophyllo denso opacæ. Foliola nulla.

A *Jung. intricata* L. et G. (Syn. Hep. 679 ; Gottsche in Mex. Leverm. 93) certe distat. Facie *Cephaloziæ*, ad hoc genus nullo modo referenda, quum ramis omnibus *lateralibus* nec posticis, gaudet.

9. JUNGERMANIA ACHROA, Spruce.

(*Cephalozia achroa* nobis olim.)

Hab. In monte *Tunguragua*, ad terram umbrosam humidam, supra *Aneuræ* speciem repens, alt. 2200^{m}.

F ·55 × ·4 ; *c* $\frac{1}{2}$^{5} ; *br* 1·1 × ·8 ; *per* 1·2 × ·5^{mm}.

Pusilla pallida subscariosa. Caules pollicares, basi subaphyllâ repentes et radicellosi, dein arcuati et subramosi, apice sæpe longe attenuati flagellares decurvi et radicantes. Rami foliosi (subarhizi) assurgentes

plerique *laterales*, folii basin posticam versus orti—semper fere supra-axillares, neque ex ipsa folii axilla enati ; alii rami *antici* sunt, sc. e caulis facie superiore orti ; alii *postici*, tunc vero plerumque ad flagella subaphylla redacti.

Folia plus minus imbricata—inferiora subpatentia, superiora assurgenti-subsecunda—oblique inserta, cuneato-ovalia-obovatave, ad dimidium usque bifida, subcomplicata—raro fere explanata, lobis acuminulatis subacutis repandis erosulisve, rarius dentato-serrulatis, postico majore lanceolato, antico subduplo angustiore paulo breviore anguste triangulari ; cellulæ mediocres oblongæ pachydermes, plurimæ scarioso-pellucidæ fere vacuæ, medianæ autem pauciseriatæ a basi ad sinum usque endochromio repletæ subopacæ.

Foliola nulla.

Flores dioici : ♀ in caule ramove terminales. Bracteæ tristichæ subtrijugæ recurvanti-patulæ, intimæ foliis duplo majores, subrotundæ ad ½ bilobæ, spinosæ, lobis inæquilatis ; bracteola intima sat minor, quadrato-oblonga spinulosa, interdum bifida, libera vel cum altera bractea connata, extima minuta.

Perianthia pyriformi-oblonga subemersa (haud matura) late obtuse 4–5-plicata, ore in lacinias plures breves spinulosas setulosasve fissa.

Amenta ♂ plerumque ramulum sistentia, raro in ramo terminalia ; bracteæ plurijugæ, foliis paulo minores, confertæ, ventricoso-concavæ, lobis brevioribus magis serrulatis, basi antica dente arguto inflexo pro more auctæ. Antheridia solitaria maxima brevipedicellata.—Unicum exemplum monoicum, inter plurima dioica, inveni.

J. intricata L. et G. Syn. Hep. 685 ; Gottsche in Mex. Leverm. 99 ; differt foliis minoribus subæquilobis profunde bifidis magis serratis.

Subgenus III. *ANASTROPHYLLUM*, Spruce.

In Journ. Bot. (1876) p. 235.

Plantæ sat elatæ, rufuscentes vel purpurascentes, assurgentes, parum ramosæ, subradicelliferæ raro flagelliferæ. *Folia* majuscula, succuba, assurgenti-secunda, ovata, concava, apice bifida (rarissime integra) ; segmentis inæqualibus, antico sat minore (in *J. monodonte* Tayl. obsoleto), pro m. acutis, sæpe incano-cuspidatis, integerrimis vel denticulatis, basi antica interdum lacinulâ aucta. *Cellulæ* parvæ subconformes ad angulos insigniter incrassatæ, cuticula scaberula. *Foliola* nulla. *Flores* dioici : ♀ terminales, raro innovati. *Bracteæ* foliis magis profunde fissæ (raro 3–4-fidæ) denticulatæque, subinde basi utrinque paucilaciniatæ. *Perianthia* roseo-purpurea, apice canescentia, maxima, prælonga, juvenilia subulata, adulta fusiformia vel inferne anguste cylindrica, apice longe pyramidalia, ab ipsa fere basi alte 3-, 5-vel 8-plicata, ore constricto fimbriata. *Calyptra* tenuis. *Capsula* brevipedicellata sæpe maxima, oblongo-cylindrica, raro subglobosa, ad basin usque 4-valvis, valvulis interdum bifidis. Flores ♂ 2–4-andri.[1]

10. *J. piligera* N. F. conferta cordato-ovata, paulo ultra ½ bifida, segmentis canescenti-apiculatis pro m. integerrimis, c. parvis oblongis. Br. parum majores denticulatæ. Per. lineari-fusiformia 5-plicata, ore incano-ciliata.

[1] See remarks on the distribution of *Jamesoniella* and *Anastrophyllum* in the memoir 'On *Anomoclada*,' already cited.

11. *J. leucocephala.* F. late subcordato-ovata, basin anticam versus laciniâ aucta, ab apice ad $\frac{3}{4}$ bifida, segmentis subacuminatis canescenti-cuspidatis, c. minutulis oblongis. Br. multo latiores, utraque basi laciniis 2–4 hamatis armatæ, lobis piliformi-acuminatis denticulatis. Per. maxima lineari-fusiformia alte 5-plicata, ore subconstricto incano breviter plurilaciniata.

12. *J. calocysta.* Pusilla. F. late ovata ad $\frac{1}{2}$ bifida, segmentis acutis vel subobtusis muticis, c. parvulis subæquilateris, trigonis magnis coloratis. Br. subconformes subdenticulatæ, segmentis subaristulatis. Per. prælonga et tenuia, obtuse 3-plicata, ore scarioso subciliata.

10. JUNGERMANIA PILIGERA, Nees.

In Hepat. Javan. 30; in Mart. Fl. Bras. I, 1, p. 341. G. L. et N. Syn. Hep. 81.

Hab. Andes Peruvianos, in saxis imis truncis et in ipsa terra montis *Campana*, alt. 1200^{m}. In Insulis Malayanis et Oceanicis (BLUME, etc.). Brasilia australis (MARTIUS).

F 1·7 × 1·3; *lobus major* ·95; *c* $\frac{1}{50}$; *br* 1·9 × 1·4; *per* 3·0 × ·75; *caps* ·8 × ·5^{mm}.

Late cæspitosa, ex olivaceo-viridi rufescens. Caules 1–3-pollicares, basi prostrati, dein assurgentes sæpeque resupinati, pauciramei, sub flore ♀ innovati, ramis innovationibusque omnibus e caulis facie postica subradicellosa ortis, subincurvis.

Folia rigidiuscula confertim imbricata succuba assurgenti-secunda cordato-ovata turgide concava, paulo ultra dimidium acute biloba, lobis inæqualibus (postico paulo majore) ovato-lanceolatis canaliculato-concavis, ex acuto apice apiculatis, apiculo setiformi canescente, integerrimis, raro apicem versus subdenticulatis; cellulæ parvæ subelongatæ guttulatæ, omnes subconformes.

Flores dioici: ♀ terminales, sæpe cum innovatione iterum florifera. Bracteæ foliis perpaulo majores, subconformes, semper denticulatæ.

Perianthia alte exserta, 4plo longiora quam lata, lineari-fusiformia, pulchre roseo-purpurea apice albida, inferne obtuse trigona, apicem versus 5-plicata, ore pluriciliata, ciliis canescentibus flexuosis. Capsula oblongo-cylindracea dimidium folium subæquans.

In eodem monte adest altera forma 3-pollicaris robustior pallidior, caule subsimplice flexuoso, foliis majoribus (2·0 × 1·6^{mm}) constanter denticulatis.

Obs. In the axils of a few of the leaves next below the bracts of the female flower I observe from 1 to 3 small filaments, some with a clavate, others with a small round head. They are probably abortive antheridia, and indicate a prior paroicous condition of the inflorescence.

11. JUNGERMANIA LEUCOCEPHALA, Tayl.

In Lond. Journ. Bot. 1846, p. 272. Syn. Hep. 665.

Hab. Andes Quitenses, in M. *Tunguragua*, ad saxa, alt. 2700^{m}; in M. Cayambe, alt. 4200^{m} (JAMESON).

F 2·1 × 1·6; *lobus major* 1·6 × 1·2; *c* $\frac{1}{64}$; *br* 2·3 × 2·3; *per* 6·0 × 1·3; *caps* 2·25 × 1·0^{mm}.

Cæspitosa rufa, interdum purpurascens. Caules 1½–2-pollicares, e caudice fragili repente orti, suberecti, parce et subfastigiatim ramosi, raro

proliferi. Radicellæ albidæ tenues breves, vel ad lineam caulis mediam posticam continuam structæ, vel in penicellum ad foliorum basin congestæ.

Folia alterna imbricata assurgenti-squarroso-secunda, late ovata, ab apice ad $\frac{3}{4}$ alt. usque acute biloba, supra basin anticam lacinulâ inflexâ subulatâ, raro bifidâ (ad ramos tenuiores nonnunq. obsoletâ) aucta, basi ipsa subcordata amplexicaulia subobliqua vel fere transversa ; lobis inæquimagnis (antico minore) ovatis subcanaliculatis sensim acutatis, subacuminatis et in cuspidem albidam piliformem abeuntibus ; cellulæ minutæ conformes subelongatæ guttulatæ subopacæ, pariete sinuato-incrassato.

Flores dioici : ♀ terminales. Bracteæ 1–2-jugæ suberectæ, foliis submajores et multo latiores, profunde bilobæ, utraque basi—antica præcipue, sæpe etiam ad sinum—laciniis hamatis 2–4-nis armatæ, lobis canaliculatis piliformi-acuminatis denticulatis late undulato-recurvis. Bracteola nulla, nisi foliolum *anticum*, parvum, pinnatifido-palmatifidove-fissum, extra bracteas positum.

Perianthia pro plantula maxima, f. caulina triplo fere excedentia, rosea, lineari-fusiformia, alte obtuse 5-plicata, ore subconstricto canescente breviter multifida et irregulariter fimbriata. Capsula magna oblongo-cylindrica, ad basin usque 4-fida, valvulis in sicco tortellis.

Planta ♂ gracilior. Andrœcia terminalia subjulacea ; bracteæ pro more paucijugæ, foliis sensim subminores, basi turgidæ, cæterum vix diversæ, diandræ.

12. JUNGERMANIA CALOCYSTA, Spruce.

Hab. Andes Quitenses, prope *Loja*, ubi ad saxa cum *Leptotricho gracili* Mitt. legit cl. G. E. MASSEE.

F 1·05 × ·90, 1·0 × ·80 ; *lobi* ·5 × ·55 ; *c* $\frac{1}{40}$; *br* 1·1 × ·9 ; *per* 3·0 × ·75^{mm}.

Pusilla laxe cæspitosa rufo-badia. Caules $\frac{2}{3}$ pollicis longi suberecti simplices vel pauciramei, quandoque innovando-proliferi.

Folia luxiuscule imbricata incurvo-subsecunda concava late ovata, basi amplexante haud cordata, apice ad medium usque biloba, lobis subinæqualibus ovato-triangularibus acutis vel subobtusis ; cellulæ parvulæ subæquilatero-hexagonæ guttulatæ, pariete incrassato intus 6-sinuato, trigonis magnis coloratis, basales paulo majores quadratæ rectangularesve.

Flores dioici : ♀ terminales. Bracteæ foliis vix longiores, subdenticulatæ, apicibus auctioribus subaristulatis plerumque canescentibus ; bracteola nulla. Folia subfloralia aliquando apice canescunt.

Perianthia alte exserta rubra, apice albida, 4plo longiora quam lata—juniora subulata, matura lineari-fusiformia obtuse triplicata, apice scarioso subfimbriata. Capsula oblongo-cylindrica.

J. piligera Nees duplo major est, foliis ultra medium fissis, lobis incano-apiculatis, cellulis subminoribus ; perianthiis 5-plicatis, ore pluriciliato.*

* I add a description of a curious species of *Anastrophyllum*, for specimens of which I am indebted to Mr Boswell, of Oxford.

JUNG. (ANASTROPHYLLUM) SCHIZOPLEURA, Spruce.

Sordide rubra elata cæspitosa. Caules 2–3-pollicares, ramos paucos subposticos edentes, fere arhizi. *Folia* subimbricata assurgenti-secunda, late cordato-ovata valde obtusata, convoluto-canaliculata apiceque incurva, basi

XXXII. NARDIA, Gray.

Nat. Arr. Brit. Pl. (1821). *Alicularia* Corda in Opiz. Beitr. (1829).

Plantæ habitu et foliatura Eujungermaniis exacte fere conformes. *Caules* prostrati vel suberecti, radicellis sæpe crebris pallidis rubrisve repentes vel intexti, ramis ex angulo foliorum postico ortis, flagellis nullis nisi interdum in *N. compressa*. *Folia* alterna succuba, vel ubi confertiora subtransversa, orbiculata reniformiave, integra retusave, rarissime biloba, margine integerrimo; *cellulæ* mediocres subæquilateræ, rarius incrassatæ, chlorophyllo granis oleaceis mixto. *Foliola* plerumque præsentia, subulata lanceolatave; in subgenere *Eucalyce* nulla. *Flores* dioici vel paroici: ♀ terminales, in statu sterili sæpe innovati. *Involucrum* (in subg. *Eunardia*) urceolatum, caulis apice tumente cavo—bracteis 2–5-jugis oppositis, cum bracteolis intermediis in tanta verticilla connatis et ex p. sibi basi adnatis (intimis saltem perianthio alte concretis) onusto—constans. *Perianthium* (in *Eunardia*) involucro obvelatum, eidem alte accretum, a latere compressulum, apice libero ovoideo conoideove obscure 3–5-carinatum, apice plerumque primum clausum, deinde in lacinias plures valvatim ruptum. *Calyptra* libera obovata tenuis, basi pistillidiis sterilibus 10–12 cincta. *Capsula* pedicello breviusculo suffulta, ovali-globosa, valida, ad basin usque 4-valvis. *Elateres* sat longi dispiri. *Sporæ* parvulæ asperulæ. *Andræcia* spicata, in caule ramove apicalia mediave; *bracteæ* 6–10-jugæ, 2–4-andræ, foliis subconformes.

Hab. In terra rupibusque humidis.—*Distr. Eunardia*, paucis speciebus constans, extra regiones boreales temperatas et frigidas nondum (quantum scio) visa. *Eucalyx*, in iisdem terris et in Australasia habitat; in montibus tropicis paucæ species vigent, quarum una, *N.* (*Eucalyx*) *hyalina*, etiam in Europa et America boreali sat vulgata est. *Apotomanthus* in insulis Antillis et in Andium media regione sylvatica crescit.

postica valde ampliata, fragillima, guttulato-areolata, cellulis minoribus quadratis marginata. *Fl.* dioici: fœm. terminales, interdum innovatione suffulti. *Br.* prælatæ erectæ, perianthium amplexantes; bracteola aliquando interposita, oblonga, sæpius hinc connata. *Per.* alte emersum anguste tubulare teres, obtuse 5-carinatum, inter carinas profunde sulcatum, inferne 2 cell. crassum *rima laterali irregulari dehiscens, apice subulato obtuso semper clausum*. *Calyptra* plus duplo brevior, ovalis inferne 2 cell. crassa. [Capsula jam decisa.]

Foliis integris (nec bilobis) inter affines anomala, solum cum *J. involutifolia* Mont. (e fretu Magellanico) comparanda; cui autem adsunt folio ovata obtusa, basi haud cordata.—*Hab. Madagascar* (Hb. H. Boswell).

Subgenus I. *EUNARDIA.*

Foliola parva subulata præsentia. *Perianthium* immersum tenerum, obscure carinatum, involucro obvelatum eidemque inferne alte adnatum. (V. supra).—*Eunardiæ* nulla species æquatorialis mihi obvia fuit.

Subgenus II. *EUCALYX*, Lindb. Bot. Notis. (1872).

Foliola nulla. *Bracteæ* 1–2-jugæ, interiores saltem perianthio basi adnatæ. *Perianthium* emersum (nec involucro velatum) sat validum, argute 3–8-carinatum, ore constricto interdum tubulari.

1. *N. hyalina.* F. suborbiculata undulata. *Br.* foliis duplo longiores, convolutivæ, duæ interiores perianthio altiuscule adnatæ. Per. ovalia alte 4–6-plicata.
2. *N. callithrix.* A priore differt foliis minoribus longioribus, cellulis subminoribus, bracteis minus alte adnatis, per. 3–5-plicatis.

Subgenus III. *APOTOMANTHUS*, S.

Folia late orbiculata, apice rotundata emarginatave. *Foliola* ubique præsentia, majuscula, lanceolata, ad *Harpanthi* foliolorum instar torta. *Bracteæ* foliis subconformes, unijugæ, interior saltem perianthio basi adnata ; br^{la} foliolis submajor, basi dentata. *Perianthium* subcylindricum, a latere compressulum, juvenile apicem versus humiliter 3-plicatum—plicis interdum rudimentarie alatis, in ætate sæpe obsoletis—ore hiante breviter 3–9-fidum.—Melius forsan pro genere proprio habendum, a *Clasmatocolea*, nisi pro bracteis perianthio adnatis, haud tam remotum.

3. *N. succulenta.* F. latiora quam longa, retuso-emarginata. F^{la} utrinque unispina, raro bi-triloba. Br. apice 3–4-lobulatæ. Per. superne obscure 2-(4-) plicata, plicis subalatis, ore triloba.
4. *N. tortistipula.* F. tam longa quam lata, apice semper fere rotundata raro retusa. F^{la} integra. Per. ore obscurissime plicata, 6–9-loba.

Obs. The generic character given above applies mainly to *Eunardia* alone, to which the other two subgenera are doubtfully united. For the sake of uniformity I place *Eucalyx* in *Nardia*, but, as I have stated above, I consider it would rank more naturally with the entire-leaved *Jungermaniæ*, to which in all other respects except the slight adhesion of the bracts to the perianth it is very closely related.—The subgenus *Apotomanthus* agrees with *Nardia* in the presence of underleaves, and the bracts are adnate to the perianth (although in a less degree); but the perianth, instead of being immersed and at first entire at the constricted apex, as in *Eunardia*, is considerably emersed, and in every stage wide-mouthed. This character, and the occasional interpolation of a bifid underleaf among the normally simple ones, indicate an approach to *Clasmatocolea*, already described; although the latter has a very different habit, and bracts quite free from the perianth.*

1. NARDIA HYALINA (Lyell).

Jungermania hyalina Lyell in Hook. Brit. Jung. tab. 63.

Hab. In sylva *Canelos* Andium Quitensium, alt. 400–1000^{m}; necnon in m. *Pichincha*, alt. 3000^{m}; in arena saxisque rivulorum inundatis. Per Europam totam, et in insulis Canariis inventa est.

* For a comparative view of the characters which distinguish *Nardia* from *Marsupella* see Spruce "On *Marsupella Stableri*" in Husnot's *Révue Bryologique* (1881), p. 92.

F 1·3 × 1·2, 1·5 × 1·3 ; *c* $\frac{1}{25}$; *br* 2·5 × 2·1 ; *per* 3·0 × 1·0^{mm}.

Cæspites lati, virescentes vel subrosei. Caules ½–1-pollicares nigrescentes, basi decumbente subaphylli, radicellis autem purpureis villosissimi et ramos paucos stoloniformes edentes, dein erecti subsimplices minus radicellosi.

Folia subimbricata patulo-ascendentia, apice recurvula, siccando valde flaccida, subobliquе orbiculata, basi antica subdecurrentia, plus minus undulata integerrima; cellulæ mediocres subæquilateræ chlorophyllosæ. Foliola 0.

Flores dioici: ♀ fertilis, innovatione nullâ, sterilis nullâ vel perrarâ, suffultus. Bracteæ foliis duplo fere majores convolutivæ, duæ intimæ basi perianthio alte adnatæ; bracteola 0 vel parva semicircularis.

Perianthia paulo vel alte emersa ovalia profunde obtuse 4–6-plicata, apice demum 4–6-fida, ore ipso integerrima. Capsula subglobosa.

Plantæ ♂ caulis tota fere longitudine antheridiiferus; bracteæ laxiusculæ, antice dilatatæ et incurvo-concavæ, diandræ. [In planta Anglica bracteas 3–4-andras aliquando invenio; interdumque intra bracteas floris ♂ apicales genitalia fœminea (semper sterilia?) quod "florescentiam paroicam" sistit, eandem ac in affini *J. obovata.*]

J. callithrix L. et G., huic affinis, minor est, prostrata; foliis subdimidio minoribus, ovatis, semper fere longioribus quam latis, haud undulatis, cellulis minoribus; bracteis minus alte adhærentibus.

2. NARDIA CALLITHRIX (Ldng. & G.), *Jungermania callithrix* L. et G. Syn. Hep. 673.

Hab. Andes Quitenses, in m. *Tunguragua*, alt. 2000^{m}, ad terram et rupes humidas. Mexico (LIEBMANN).

F ·75 × ·5; *c* $\frac{1}{35}$—$\frac{1}{25}$ ^{mm}.

Viridis, prostrata. Caules ¼–⅓-pollicares, subsimplices, radicellis crebris longissimis rubellis intertexti matricique arcte adhærentes, sæpe versus medium incrassati.

Folia pellucida imbricata patula concava vel subplana, ovato-rotunda, integerrima, siccando flaccida; cellulæ mediocres æquilateræ subpellucidæ, marginales subquadratæ. Foliola 0.

Flores dioici: ♀ terminales, plerumque sine innovatione; bracteæ foliis sublatiores, interna saltem perianthio basi adhærens.

Perianthia subemersa ovata obtuse 3–5-plicata, ore constricto demum 3–5-lacera.

Amenta ♂ terminalia: bracteæ paucijugæ, ventricoso-concavæ, margine antico subdilatatæ incurvulæque, diandræ.

3. NARDIA SUCCULENTA (Rich. Mst.) var. CROSSII.

Hab. Andes Bogotenses juxta *Popayan*, in rivuli arena, *Cephalozia Crossii* consociata. Cl. ROB. CROSS invenit, a. 1877.

F 1·3 × 1·8, 1·15 × 1·4, 1·0 × 1·2; *c* $\frac{1}{24}$—$\frac{1}{20}$, *c. marginales* $\frac{1}{30}$; f^{la} ·8 × ·4; *br* 1·6 × 1·8 ; br^{la} 1·3 × ·6; *per* 2·3 × 1·1 ; *caps* ·75^{mm}.

Arcte cæspitosa pallide viridis tenerrima. Caules suberecti simplices vel ramos perpaucos e facie subpostică proferentes, radicellis albidis longis crebris sibi matricique adfixi.

Folia imbricata assurgenti-secunda patentia vel accumbentia, lineâ obliquâ arcuatâ inserta, latiora quam longa, suborbiculata reniformiave retuso-emarginata, sinu obtuso, angulis rotundatis, margine obtuse angulata, facie subundulata (superiora præcipue); cellulæ majusculæ leptodermes, ad angulos vix subincrassatæ, subchlorophyllosæ, marginales subminores quadratæ fere vacuæ.

Foliola $\frac{1}{3}$ breviora lanceolata sensim acuminata, torta sæpeque recurva, utrinque infra medium dente spinave aucta—vel inæqualiter triloba—rarissime subæqualiter biloba.

Flores dioici: ♀ terminales, innovatione una alterave postica—interdum nulla—suffulti. Bracteæ propriæ unijugæ erectæ arcte appressæ, altera (interior) basi ad $\frac{1}{4}$–$\frac{1}{3}$ alt. usque cum perianthio concreta, altera fere libera, foliis paulo majores oblato-orbiculatæ 3–4-lobulatæ vel pluri-crenatæ, lobulis crenulisve crispis; bracteola subbrevior foliolis subconformis major tamen, basin versus sæpe dente uno alterove utrinque aucta. Folia infrafloralia 1–2-juga cæteris caulinis magis conferta latioraque apice sæpe emarginato-triloba.

Perianthia subemersa cylindrico-oblonga compressa truncata, apicem versus obscure 3- (4-) plicata, plicis suturisve interdum subalatis, ore indistincte 3-lobo dein grosse crenato vel lobulato, lobulis crispulis. (Unum perianthium vidi cui suturæ duæ posticæ in alam angustam intra (nec extra) perianthium prominebant; idem quod inter *Plagiochilas* interdum accidit. Calyptra duplo brevior libera tenuissima. Capsula globosa sordide ruberrima, pedicello valido longiusculo.

Andrœcia medio caule posita; bracteæ foliis consecutivæ subconformes, breviores autem basique ventricosæ; antheridia jam decisa.

Syn. Jungermania succulenta Rich. Mst. in Lehm. et L. Pug. IV.; G. L. et N. Syn. Hep. 84.

4. NARDIA TORTISTIPULA, Spruce.

Hab. Andes Quitenses, in scopulis humidis ad cataractam *Agoyán*, alt. 1700^{mm}.

F 1·25 × 1·25, 1·5 × 1·65, 2·0 × 2·0; $c\frac{1}{24}$–$\frac{1}{20}$; f^{la} ·6...1·5 *longa; per* 2·0 × 1·0; br^{la} 1·0 × ·5, 1·5 × ·7^{mm}.

Cæspitosa viridis pellucida tenerrima. Caules $\frac{1}{4}$–1-pollicares erecti vel procumbentes, basi radicellis intertexti, flagellis nullis.

Folia alterna, inferiora parva, superiora increscentia, majuscula, assurgenti-subsecunda, late imbricata, suborbiculata, apice rotundata rarius retuso-truncata, concava integerrima repandula; cellulæ majusculæ quadrato-hexagonæ leptodermes fere vacuæ, marginales subquadratæ.

Foliola foliis haud multo breviora, ovato-lanceolata sensim acuminata, vel lanceolato-subulata, torta et ex alis recurvis sæpe canaliculata.

Flores dioici: fœm. terminales, steriles innovatione, fertiles nulla, suffulti. Bracteæ unijugæ erectæ, foliis vix majores, conformes, interior brevi spatio perianthio adnata; bracteola foliolis paulo major, lanceolata, hinc unidentata, rarius subæqualiter bifida, basi perianthio leniter adnata.

Perianthia tenerrima, juvenilia campanulata, ore hiante cellulis longis papilloso-crenulata, matura ovali-oblonga vel subcylindracea subteretia compressulave ecarinata, ore truncato vix parum plicata breviter 6–9-fida edentata, semper plus minus disrupta. Capsula altiuscule exserta fere globosa tenera lurido-purpurea.

Andrœcia medio caule posita; bracteæ plurijugæ foliis consecutivæ, paulo minores, ventricosæ, antheridiis jam decisis.

Ab hac differt *Nardia succulenta* (Rich.: typica, sec. specimina in insula *Guadaloupe* a cl. Husnot et L'Herminier lecta) statura submajore, foliis lateraliter patentibus *omnibus emarginatis*, cellularum pariete ad angulos valide incrassato; foliolis latioribus triangulari-ovatis, sæpe obtusis, arcuato-incurvis magis canaliculatis; bracteis basi altius adnatis; perianthiis semper fere immersis, obtuse sed sat distincte trigonis, angulis 2 posticis *interne* in alam plus minus latam prominulis. Calyptra tenuis. Capsula subglobosa, in pedicello brevi (perianthio duplo longiore) suffulta, valvulis haud raro bifidis. *Nardia succulenta* var. *Crossii* a forma typica differt foliis secundis vix tam profunde emarginatis, cellularum pariete minus incrassato; foliolis minoribus et planioribus; perianthiis sublongioribus.

XXXIII. ACROBOLBUS, Nees.

In G. L. et N. Syn. Hep. p. 5 (1844). *Gymanthe* Tayl. Mst.

Plantæ aspectu magnitudineque, necnon foliis bifidis, *Jungermaniæ* (*Lophoziæ*) *ventricosæ* vel *sociæ* simillimæ. *Caules* prostrati radicellosi, simplices furcative, rarius ramum unum alterumve sublateralem proferentes. *Folia* succuba alterna subquadrata bifida—superiora interdum trifida—integerrima vel dente hic illic armata, reti mediocri. *Foliola* nulla. *Flores* dioici: ♂ terminales. *Bracteæ* 1–2-jugæ, magnæ, plurilobæ, undulato-crispatæ. *Pistillidia* 10–22. *Marsupium* breve, obovato-globosum carnosum, ore squamulis nullis vel perraris et subulatis circumdatum. *Calyptra* marsupio ad apicem usque adnata, ibidemque pistillidiis sterilibus coronata. *Pedicellus* basi calceolatus. *Capsula* oblonga (valde juvenilis solum visa). *Andrœcia* mihi ignota.

Hab. et *Distr.* Species solitaria huic generi certe adscripta in terra inter muscos viget; in Hibernia australi a cel. WILSON et TAYLOR primum inventa, serius in Andibus Quitensibus meipso lecta.

1. ACROBOLBUS WILSONI (Tayl.) Nees. Syn. Hep. 5.

Jungermania Wilsoni Tayl. Mst.; *Gymnanthe Wilsoni* Tayl. in Syn. Hep. 192; Gottsche, Ueber die Fructif. *Jungermaniæ Geocalycæ*, 38, t. 3, figs. 22–27.

Hab. Var. *Andinus* S. in monte *Tunguragua*, ad terram inter cæspites *Anastrophylli leucocephali* (Tayl.) repens.

F. inferiora 1·5 × 1·2, *superiora* 1·5 × 1·5, *c. mediæ* $\frac{1}{30}$—$\frac{1}{25}$ mm.

Pallide viridis tenera. Caules semipollicares flexuosi prostrati, radicellis paucis albidis matrici adfixi, apice libero assurgentes, parum ramosi, interdum simplices, vel solum innovando-continui.

Folia succuba, oblique inserta ; inferiora subcontigua subquadrata, ad $\frac{1}{3}$ subacute bifida, angulata, segmentis divergentibus tenui-acuminatis acutis ; superiora increscentia, magis conferta, latiora, laxe complicata, segmentis inæqualibus acuminatis, inferiore subrhombeo, superiore augustiore lanceolato-triangulari, margine crispata, angulata vel hic illic incisula, subinde basin versus utrinque hastatim unidentata ; cellulæ mediocres hexagonæ, subleptodermes, endochromio sparso subopacæ, folii mediam basin versus longiores, subrectangulares.

Flores dioici : ♀ terminales, demum innovatione suffulti. Folia subfloralia latiora quam longa, amplexicaulia, sæpius triloba, insigniter incisulo-crispa ; bracteæ propriæ juveniles, adhuc parvæ, profunde lobatæ. Pistillidia sub 10, receptaculo convexo purpureo insidentia. Cætera desunt.

Obs. In specimine Taylori archetypo, in monte *Knockavohila* Hiberniæ lecto, caulis pollicaris est, sæpe furcatus. Folia ad $\frac{1}{4}$ (interdum solum ad $\frac{1}{5}$) usque biloba, lobis plerumque subacuminatis apiculo 3–4 cellulas longo auctis, sinu pro more obtuso, basi antica vix leniter recurvula ; cellulæ pariete tenui vel ad angulos vix incrassato. Bracteæ intimæ primum parvæ, demum magnæ, valde lobatæ laciniatæque, undulato-crispæ. Marsupium obovato-globosum, valde carnosum, pariete 6–7-strato (calyptra inclusa, ad apicem usque marsupio adnata). Pistillidia 20 et plura, erecta, confertissima, subcylindrica, basi paulo dilatata. Pedicellus basi calceolo cyathiformi viridi 5-lobo receptus.

Folia caulina, involucrum versus præcipue, haud raro dente uno alterove marginali armata.—In receptaculo ♀ invenit cl. Gottscheus pistillidia cum lobulis phylloideis (pistillidiis transformatis) mixta.

This plant confronts us with a problem that admits of two solutions, and there are some others in similar case. The differences (which nearly always exist) between the tropical and the temperate form may to some observers appear adequate to justify their being held distinct species, while to others they will seem merely varietal ; although all will readily admit that, at some period more or less remote, both forms have had a common ancestor. *Jubula Hutchinsiæ*, *Lepidozia cupressina*, and *Dumortiera hirsuta* are some of the hepaticæ, and there are several mosses, that leave us in the same dilemma. I have tried to decide all such questions from the evidence of structure alone, without any reference to geography. Thus, as to *Acrobolbus Wilsoni*, plants of the Andine form placed beside others of the European form, are in most respects so very like that, although the leaves of the former are more deeply cloven, and the segments are rarely so fine pointed, I cannot venture to separate them specifically.

Subtribus VII. FOSSOMBRONIEÆ.

Plantæ vel foliosæ, post siccationem flaccidæ tenerrimæ, vel sæpius frondosæ ; prostratæ, subsimplices vel dichotomæ, raro ramos (frondulas) e facie postica proferentes, rarissime basi rhizomatosæ. *Caulis* raro teres, plerumque subplano-convexus, in aliis tenuis, in aliis prælatus. *Folia* (ubi adsunt) succuba vel subtransversa, sat magna et lata, integra vel apice rude incisa. *Frondes* margine vel

integerrimæ serrulatæve vel sæpe tam regulariter et profunde fissæ ut segmenta pro foliis distinctis fere habenda (e.g. in *Symphyogyna*, *Pellia*, &c.); interdum lamellis longitudinalibus supra percursæ. *Foliola* nulla præter in genere *Scalia* (cui solo radicellæ omnino absunt). *Flores* dioici, raro monoici. *Antheridia* brevistipitata vel subsessilia, in caulis facie tota fere supera margines versus posita; in aliis generibus foliosis nuda, 2–5-na, foliis (cæteris foliis subconformibus) approximata, vel laxe obvelata; in aliis tam foliosis quam frondosis in alveolis, primum strato caulis corticali clausis, recepta, solitaria vel 2–3-na; in aliis frondosis alveoli monandri ab initio aperti sunt, bractea minuta incurva obvelati. *Flores* ♀ terminales, vel hic illic in caulis facie supera subsessiles, et vel involucrati vel in caulis apice excavato, involucri et perianthii vicibus fungente, absconditi. Bracteæ (ubi adsunt) semper foliaceæ, interdum minutæ. *Pistillidia* pauca—plurima; sterilia in fructu maturato vel libera vel calyptræ adnata; adveniunt insuper in paucis speciebus alia pistillidia rudimentaria, extra involucrum in caulis facie longitudinaliter subseriata. *Perianthium* persæpe nullum; ubi adest frequenter, e phyllis postice vel utrinque inter se subliberis, incompletum; in *Pallavicinia* autem perfecte tubulare. *Calyptra* raro parva tenuis; plerumque elongata, carnosa, ab involucro libera, cum toro genitali autem in aliis generibus plus minus alte concreta. *Pedicellus* plerumque sat crassus, raro brevis, interdum longissimus. *Capsula* in aliis subglobosa, in aliis subcylindrica, 1-vel 2–5-strata, 4-valvis, rarius autem ad valvularum suturas omnes complete dehiscens, nunc ab apice irregulariter vel pedetentim rupta, nunc uno solo latere hians (ad speciem follicularis). *Elateres* 2-(raro 1–4-) spiri, alii—nunc basales, nunc apicales—a cæteris persæpe diversiformes et diutius persistentes. *Sporæ* utplurimum magnæ, læves vel asperrimæ.

§ 1. FOSSOMBRONIEÆ TYPICÆ.

Plantæ foliosæ vel frondosæ. *Perianthium* (melius *involucrum*) incomplete tubulare vel cyathiforme, phyllis vel postice vel utrinque breviter (vel vix) connatis. *Pistillidia* involucri plerumque pauca, aliis autem nudis in caule seriatis frequenter adjectis. *Calyptra* subglobosa. *Capsula* globosa vel ovalis, *bi-* (*raro pluri-*) *strata*, cellulis strati intimi fibras annulares vel spirales includentibus, regulariter 4-valvis vel sæpe irregulariter et plus minus pedetentim dehiscens. *Elateres* 2–4-spiri, rarissime monospiri, basales interdum breviores et subpersistentes, cæteros plurimos normales in acervulum globosum diu tenentes. *Antheridia* in costæ facie supera margines versus sparsa, foliis (ubi adsunt) vix velata; vel in alveolis primum strato corticali opertis, demum detectis, nidulantia.

34. FOSSOMBRONIA. Pusilla, fragilis. F. subquadrata. Antheridia

nuda, 2–3na. Per. campanulata, phyllis postice discretis. Capsula pedetentim rupta. Sporæ asperrimæ.

35. NOTEROCLADA. Grandiuscula succulenta. F. subrotunda. Antheridia solitaria, in pustulis primum clausis demum ruptis recepta. Per. compresso-cyathiformia, phyllis basi connatis, apice alte liberis, bilabiata. Caps. subregulariter 4-valvis. Sporæ læves.

§ 2. LEPTOTHECEÆ.

Vegetatio frondosa rara foliosa. *Perianthium* persæpe nullum, raro perfectum subcylindricum. *Calyptra* prælonga subcylindrica, pistillidiis sterilibus basi et altius—interdum solum in ipso apice—obsita. *Capsula* longipes, oblongo-cylindrica, *unistrata*, cellulis angustis vacuis conflata 4-valvis, suturis valvularum demum sæpius imperfecte solutis, sicuti dehiscentia frequenter solum unilateralis videtur. *Elateres* di- (raro ex p. mono-) spiri, alii in capsulæ apice diutius persistentes. *Antheridia* in foliosis laxe axillaria 2–5na; in frondosis in alveolis costæ marginalibus nidulantia, solitaria, minute unibracteata.

A. *Foliosæ.*

36. SCALIA. Caules basi rhizomatosi, radicellis omnino carentes. F. tristicha, subopposita. Per. 0. Cal. magna. Capsula subcylindrica sæpe hinc solum hians.

B. *Frondosæ.*

37. SYMPHYOGYNA. Fr. lineares dichotomæ, interdum serratæ vel pinnatifidæ; costa angusta, filo axiali lignoso percursa. Fl. ♀ vel terminales vel antici et subsessiles, minute involucratæ. Per. 0. Cal. longissima carnosa apice pistillidiis sterilibus coronata. Capsula in dehiscentia quadrivalvis, valvulis interdum apice cohærentibus.

38. PALLAVICINIA. A *Symphyogyna* vix discrepat nisi pro perianthii tubularis præsentia, et calyptra tenuiore solum infra medium pistillidia sterilia gerente.

39. MONOCLEA. Frondes cuneatæ dichotomæ, costa prælata et crassa percursæ. Fl. ♀ terminales, in costæ apice cavo absconditi, exinvolucrati. Per. 0. Calyptra compresso-cylindrica, apice bilabiata, inclusa. Capsula exserta oblongo-cylindrica, uno solo latere dehiscens, demum fere explanata.

Obs. The plants I have grouped in this subtribe are confessedly a somewhat heterogeneous assemblage, and might perhaps have been better divided into two or even three subtribes; but the species I gathered are so few, and they belong to so few genera, that I profit by the very slight bond of union between them to join them in one. There is in none of them any distinct male spike, with proper bracts, but the antheridia, even in the foliose genera, stand along each margin of the stem, slightly or not at all veiled by adjacent lateral leaves, which are not sensibly modified in form, or more closely-set than ordinary stem-leaves; the antheridia are thus either quite unprotected, as in *Fossombronia*, or they are contained in little pits (alveoli) closed at first by the cortical stem-layer, which is finally ruptured to allow the contents of the antheridia to escape, as in *Noteroclada*, *Pellia*, &c. In some frondose genera the pits are open from the first, but partially veiled by small toothed bracts, which are often confluent along the margin of the stem (or costa) into a linear wing: e.g. in *Symphyogyna*, *Pallavicinia*, *Blasia*, &c. Sometimes,

along with the antheridia, but slightly internal to them, stand rows of naked abortive pistillidia, as in *Noteroclada* and some *Fossombroniæ*; which may be looked on as a paroicous inflorescence, limited only by the length of the stem.

The *Fossombronieæ* proper are distinguished from those of the following section by a globose or very slightly oval capsule of two (rarely of more) cell-layers, whereof the innermost cells include a spiral thread, either entire or broken up into rings. While most of the genera are frondose, there is no denying the existence of true leaves in *Fossombronia* and *Noteroclada:* a difference really of slight importance, as I have shown in my memoirs on *Anomoclada* and *Cephalozia.** In the frondose *Pellia epiphylla*, *P. calycina*, &c., the frond is cut down sometimes nearly to the broad thin midrib into wide lobes (almost distinct leaves) which imbricate slightly at the edges; and the resemblance to *Noteroclada* is so close in the fleshy texture when fresh, flaccid when dry; the antheridia enclosed in superficial pustules; the structure of the involucre (called a "perianth" in *Noteroclada*, but scarcely deserving the name); the inordinately long pedicel; the globose capsule, of tender consistence, so as to be sometimes imperfectly valvular in dehiscence, although not fragmentary as in *Fossombronia;* and the elaters persisting for a while, gathered into a ball in the base of the capsule: that there is no disputing the near affinity of the two genera.

The genera included in the § *Leptothecæ* agree in one remarkable character, hardly found elsewhere in Jungermaniaceæ, viz. the long cylindrical *capsule of only a single layer of cells*, which contain no spiral or annular fibre. The two genera of this section most closely allied, *Symphyogyna* and *Pallavicinia* (*Blyttia* Syn. Hep.), have been previously placed in distinct suborders, because in the latter there is a distinct perianth and none in the former: almost the only difference between them, and serving to show how very fallacious may be the reliance on a purely negative character, such as the gymnomitrous fruit of a hepatic or the gymnostomous capsule of a moss.

The anomalous genus *Scalia* (*Haplomitrium* Nees) stands among *Leptotheceæ* purely by virtue of the form and structure of its capsule; but in its remaining characters it is almost as widely separated from them as from all other hepaticæ (the eastern *Rhopalanthus* Lindberg, and *Calobryum* N. perhaps excepted).—Hooker has been taken to task for calling the elaters of *Scalia Hookeri* (Lyell) monospirous, when they are dispirous; but in reality, in the Andine as well as in the British species, a few elaters that remain attached to the apex of the valves for some time after the others are freed contain a helix of only a single thread; and it was doubtless these apical elaters alone that Hooker examined and figured.

XXXIV. FOSSOMBRONIA, Raddi.

In Act. Sc. Soc. Moden. (1820); Lindberg *Manip. Muscorum sec.* in Notis. pro F. et Fl. Fenn. (1874).

Plantæ pusillæ tenerrimæ, sæpius pallidæ, inodoræ vel fœtidæ,

* The leaves in the solitary species of *Noteroclada* described below are considerably imbricated, but in Taylor's *N. confluens* they are either only slightly imbricated, or even merely contiguous, but never at all *confluent*, as I have ascertained by the examination of his original specimens, so that the specific name is not a happy one.

strato tenui crescentes. *Caules* breves fragiles, simplices vel furcati, sæpe innovando-continui, radicellis rubris (raro pallidis) longissimis, interdum compressis, repentes. *Folia* magna succuba, lata basi obliqua vel sublongitudinali antice decurrente inserta, subquadrata, sæpe latiora quam longa, undulata, rarius plicata, apice lato lobulata sinuatave interdum subdentata; *cellulæ* sat magnæ, inferiores in aliis speciebus 2–3-stratæ. *Foliola* nulla. *Flores* dioici vel monoici: ♀ terminales. *Bracteæ* foliis submajores, conformes vel magis incisæ; bracteola postica angusta raro adjecta est; in aliis speciebus adveniunt bracteæ interiores, ad squamulas lineares redactæ, perianthii angulis tanquam alas adnatæ. *Pistillidia* terminalia pauca (2 v. 3); inveniuntur autem alia sterilia plus minus rudimentaria, in caulis facie superiore sparsa. *Perianthium* campanulatum vel obpyramidatum, ore hiante lobatum; sistit phyllis duobus, antice connatis, postice tota longitudine discretis margineque sese plus minus late imbricantibus. *Calyptra* libera subglobosa tenuis. Capsula brevi-pedicellata globosa bistrata, cellulis interioribus pro m. fibra annulari fulcitis, 4-valvis, dehiscentia autem irregulari, valvulis erosis apice cito caducis. *Elateres* breviusculi obtusi, 1–3-(plerumque 2-) spiri, cito decidui. *Sporæ* magnæ asperrimæ. *Antheridia* per 2 vel 3 sæpe aggregata, aurantiaca, brevipedicellata; subinde pistillidiis sterilibus consociata.

Hab. et Distr. Species haud numerosæ in terra humida, limosa vel paludosa precipue, vigent. Nullis terris absentes, in Europa frequentiores videntur. Ipse in Andibus orientalibus 4 species legi, omnes rariores. In planitie Amazonica speciem quintam ad fluvii *Aripecuru* ripas inveni; specimina autem sterilia, pauperrima, itaque ea nominare non ausim.

A. *Flores monoici.*

1. *F. crassifolia.* F. densissima, multo latiora quam longa, 3–4-plicata, margine sinuata, dimidio infero incrassata. Per obpyramidata, angulis alatis. *Sporæ* cristis, sub 24 in margine prominulis, ornatæ.
2. *F. tenuifolia.* F. imbricata, paulo longiora quam lata, tenuissima, solum in ipsa basi 2-strata. Per. campanulata exalata. Sporæ cristis 18 in margine.

B. *Flores dioici.*

3. *F. lophoclada.* Caulis e foliis basi antica prælonge decurrente crispulis ad speciem bicristatus. F. oblique oblongo-quadrata, superiora obtuse bifida incisave.
4. *F. ptychophylla.* F. late imbricata, magna, tenera, 2–3plo latiora quam longa, pluriplicata, ad speciem venosa.

1. FOSSOMBRONIA CRASSIFOLIA, Spruce.

Hab. Baños, ad pedem M. *Tunguragua*, in solo nigro humidiusculo.

F 1·5 × 2·3, 2·0 × 3·0 ; *c* $\frac{1}{15}$–$\frac{1}{12}$ (*inf.*), $\frac{1}{25}$ (*sup.*) ; *per* 2·0 × 1·8 ; *cal* 1·3 ; *caps* 1·0 ; *elat* ·25 ; *sporæ* $\frac{1}{25}$ mm.

Subinodora pallide viridis, strato simplice effusa. Caules 5mm longi crassiusculi fragiles, simplices v. parum ramosi, sæpissime arcuati apice decurvi, subtus purpurascentes, radicellis longis subpallidis adfixi; supra processubus minutis fuscidulis linearibus, 3 cell. diametro, (pistillidiis rudimentariis) sæpe fere tota longitudine sparsi.

Folia confertissima late imbricata assurgentia, forma irregularia multo latiora quam longa (i.e. basi latissimâ obliquâ fere longitudinali inserta), antice dilatato-rotundata, postice margine subrecta, quasi dimidiato-obovata, crispato-3–4-plicata, plicis in sinubus marginalibus parum profundis desinentibus, cæterum integerrima, a basi ultra medium incrassata, *media basi* 3 *cellulas crassa*, utroque latere sensim attenuata, marginibus apiceque 1 solam cellulam crassa; cellulæ subbasales apicalibus duplo majores.

Flores monoici : ♀ terminales, sæpe binati ; bracteæ foliis similes, majores tamen.

Perianthia foliis subæqualia, late obconico-campanulata, ore dilatato sinuato-lobulata recurvula, plus minus carinata (i.e. obpyramidata), ad carinas irregulariter foliaceo-alata. Calyptra paulo brevior oblongo-globosa tenuis, demum apice irregulariter rupta. Capsula calyptra paulo minor globosa, pedetentim rupta, tenuis, pallida, spiris endothecii valde imperfectis fulvis. Sporæ magnæ ($\frac{1}{25}$ mm) subglobosæ, alte cristatæ, cristis subradiatis, interruptis, parce anostomosantibus, acie unisulcis, sub 24 in sporæ margine prominulis. Elateres $\frac{1}{4}$mm longi, 2-(raro 1–3-) spiri, flexuosi, obtusi. Pedicellus 4mm longus.

Antheridia 2–3na, foliis superioribus antice approximata, iisdem vix axillaria, pistillidiis sterilibus consociata.

F. Wondraczcki Corda, huic subaffinis, differt foliis tenuibus et sporis creberrime cristatis.

2. FOSSOMBRONIA TENUIFOLIA, Spruce.

Hab. Andes Quitenses, in monte *Altar*, ad terram umbrosum.

F 2·5 × 2·0 ; *c* $\frac{1}{18}$; *br* 2·5 × 3·2 ; *per* 3·0 × 2·5 ; *ped* ·5mm.

Viridis fragilis fere inodora. Caules $\frac{1}{4}$–$\frac{1}{2}$ poll. subramosi radicellis longis validis purpureis repentes.

Folia assurgentia imbricata subquadrata rhombeave, apice lato plus minus sinuato-lobulata crispataque, tenuissima, cellulis unistratis, v. nonnisi ipsa basi bistratis, majusculis subpellucidis, inferioribus subelongatis, conflata.

Flores monoici : ♀ terminales in caule sæpe iteratim innovando-prolifero ; bracteæ foliis latiores magis sinuato-lobulatæ.

Perianthia subemersa campanulata, pro m. exalata, ore hiante recurvulo lobata, lobis subacuminatis. Capsula sporæque fere eædem ac in *F. crassifolia*, istæ autem minus arcte cristatæ, cristis prælatis, parum anostomosantibus, sub 16 in sporæ margine prominulis.

Antheridia in caulis facie superiore nuda; subinde iisdem mixta adveniunt pistillidia pauca sterilia, caulis apicem versus præcipue.

F. crassifolia differt radicellis pallidioribus; foliis latioribus quam longis, inferne carnosis et ad speciem laticostatis; sporis magis crebre cristatis.

3. FOSSOMBRONIA LOPHOCLADA, Spruce.

Hab. ac terram purpuream in humidis umbrosis montis *Campana*, in Andibus Peruvianis: pl. ♂ sola.

F 1·8 × 1·3 (*basi* × 2·0); *c* $\frac{1}{16}$–$\frac{1}{10}$mm.

Pallide viridis albicansve in plagas latas extensa. Caules semipollicares subsimplices, e foliis decurrenti-crispulis supra quasi bicristati, radicellis validis compressis (fasciæformibus) pulchre purpureis matrici arcte adfixi.

Folia conferta horizontaliter patula suboblique quadrato-oblonga-rhomboideave, apice truncato retusa, superiora obtuse bifida raro angulato-incisa, infra medium antice valde dilatata et decurrentia, ibidem sinuato-crispula; cellulæ magnæ leptodermes pellucidæ, superiores æquilateræ, inferiores subelongatæ.

Flores dioici. Antheridia nuda, supra caulem transverse aggregata, 2–3na, mediocria, brevipedicellata.

4. FOSSOMBRONIA PTYCHOPHYLLA, Spruce.

Hab. Andes Quitenses, in palude alpina montis *Altâr*, loco *Condorusto*, alt. 3700m, ubi inter cespites *Azorellæ* speciei pauca specimina legi, mense Jan. 1859.

F 3·0–4·0mm *longa*, 6·0–12·0mm *lata*; *c* $\frac{1}{12}$–$\frac{1}{8}$mm *longæ*.

Caules pollicares simplices carnosi flexuosi, ope radicellarum purpurearum super cæspites Azorellæ erectos repentes (ad *Odontoschismatis Sphagni* supra *Leucobryum* instar), apice eosdem subsuperantes et subincurvi.

Folia magna albida tenera, siccando flaccida, late imbricata succuba, assurgenti-secunda, fere longitudinaliter inserta, valde oblata, 2–3-plo latiora quam longa, subrhomboidea, pluri-plicata, plicis angulum 70° cum caule efformantibus venasque fingentibus, margine inæqualiter lobata sinuataque; cellulæ magnæ hexagonæ parum elongatæ leptodermes, fere vacuæ.

F. *intestinalis* TAYL.! Mst. in G. L. et N. Syn. Hep., Ins. Auckland, Hookero fil. lecta, caracteribus sequentibus differt.

Virescens, prostrata *subramosa*, 1–2½-pollicaris, radicellis purpureis validis matrici adfixa. Folia longitudinaliter inserta imbricata succuba, *distiche patula*, nec secunda, *paulo* latiora quam longa (3 × 4mm) convoluto-bullata, obtuse 3-*plicata*, *plicis ad angulum* 45° *directis*, margine 3–5-angulato-lobata, angulis interdum apiculatis, cæterum repanda; cellulæ magnæ subpellucidæ.*

XXXV. NOTEROCLADA, Tayl.

Hep. Antarct. in Lond. Journ. Bot. (1844). *Androcryphia* Nees in Syn. Hep. 470 (1846).

Plantæ sat magnæ, succulentæ, e viridi purpurascentes, siccando fuscidulæ flaccidæ; caule prælato subsimplice radicellis longissimis

* Corresponds with Taylor's description—not so with Mitten's, who calls the species "minute ⅛–¼ inch long"; whereas these specimens are six times as large, and decidedly robust.

arcte repente. *Folia* magna, succuba, fere longitudinalia, plano-disticha, matrici adpressa, subrotunda integerrima, dimidio infero bistrata; cellulis magnis subæquilatero-hexagonis. *Foliola* nulla. *Flores* utriusque sexus in eodem et in diverso individuo: ♀ terminales. *Bracteæ* foliis 2 subfloralibus, ovalibus ligulatisve, foliis proximis sæpe absconditis, constantes. *Perianthium* (melius *involucrum*) apice caulis cavo cum phyllis duobus in cyathum a latere compressum, ore alte bilabiatum concreto, constans. *Pistillidia* plurima, alia intra involucrum recepta, alia minora externa super caulem subseriatim ordinata. *Calyptra* inclusa bistrata, ad apicem usque pistillidiis sterilibus (paucis) conspersa. *Pedicellus* longissimus. *Capsula* globosa, valvulis 4 subæqualibus (interdum minus regulariter) dehiscens, bistrata; cellulæ interiores fibris annularibus vel subspiralibus farctæ. *Sporæ* magnæ læves. *Antheridia* in caulis facie supera, margines versus, sparsa, solitaria, in alveolis strato caulis corticali (demum disrupto) velatis immersa, ovali-globosa, subsessilia.

Hab. et Distr. Species 3 adhuc descriptæ, in terra humida umbrosa Andium, Brasiliæ, Fuegiæ et Australasiæ vigent.

1. NOTEROCLADA LEUCORHIZA, Spruce.

Hab. Andes Quitenses, in monte *Altar*, alt. 3000^{m}, supra alias hepaticas foliaque emortua repens.

Caules 1·7 *lati*, 0·5 *crassi*; *folia* 3·8 × 3·0; *c* $\frac{1}{12}$–$\frac{1}{8}$; *bracteæ* 2·6 × 1·5, ·6 × ·35; *per* 6 × 2^{mm} (*et minora*); *ped* 50–80^{mm}.

Caules 1–2-pollicares prælati plano-convexi carnosi pluristrati, radicellis prælongis albidis arcte repentes, simplices vel subramosi.

Folia magna, e pallide viridi purpurascentia, carnosula, siccando fusca, tenera flaccidaque, succuba, sublongitudinaliter inserta, late imbricata, perfecte explanata, apicalia sola assurgentia, suboblique ovato-rotunda integerrima, a basi ad medium usque, dimidiaque latitudine, e cellularum serie duplici conflata (quasi late costata), marginibus apiceque cellulis unistratis constantia; cellulæ magnæ leptodermes parce chlorophyllosæ, subæquilatero-hexagonæ, inferiores solæ elongatæ. Foliola 0.

Flores monoici et dioici: ♀ terminales; bracteæ nullæ nisi folia suprema 1–2-juga, cæteris foliis paulo (raro multo) minora et angustiora.

Perianthia assurgentia, apice caulis excavato cum foliis 2 floralibus in cyathum bilabiatum patulum connatis constantia, demum sæpe irregulariter 4–loba, tubo hinc cristato vel non; interdum tamen magis elongata, folia subduplo superantia, tubæformia, valde compressa, apice sinuato-truncato breviter bilabiata, antice crista longitudinali percursa. Calyptra inclusa oblongo-globosa basi ipsa caulis orificio accreta, ad apicem fere usque pistillidiis sterilibus sparsa, cellularum serie duplici conflata. Pedunculus longissimus 2–3-pollicaris pellucidus fragilis. Capsula majuscula flavida globosa, fere ad basin

usque subæqualiter 4-valvis. Elateres in fundo diu persistentes longissimi dispiri. Sporæ magnæ læves.

Antheridia in caulis (pl. ♀ v. distinctæ) facie superiore sparsa, sæpe per paria foliorum basi approximata, in loculis prominulis conicis, primum clausis, demum ruptis, solitaria, magna albida subsessilia.

Pistillidia tenuia rigidula purpurascentia, in receptaculo ♀ sub 20, quorum unum fertile cito in calyptram transmutatur; cætera sterilia ex parte calyptræ basin circumstant, alia autem cum calyptra maturante tolluntur et in ejus superficie persistunt. Adveniunt etiam extra florem, super costam—interdum in tota sua longitudine—pistillidia sterilia nuda permulta, internis omnino conformia nisi parum minora; florem versus sæpe cum antheridiis consociata, his autem costæ marginibus magis approximata.

Capsula bistrata est, strato externo crasso, e cellulis subquadratis, columnis angularibus fulcitis; interno longe tenuiore e cellulis elongatis irregularibus, fibra spirali laxa interrupta repletis. Elateres bispiri, vel ad dimidium usque 3-spiri, alii plures in capsulæ fundo alte convexo longius persistentes, cæteris autem homomorphi. Pedicellus cellulis pluristratis alternis conformibus conflatus.

Obs. I cannot venture to combine this plant with Taylor's *Noteroclada confluens*, of which I have an original specimen, gathered by Sir J. Hooker at Cape Horn. Besides minor differences, the leaves of *N. confluens* differ in being scarcely at all imbricated, broader than long, in about the same proportion (4 to 3) as those of my plant are longer than broad; but they are thickened towards the middle base in the same way, and the stem is villous beneath with long white radicles, as in *N. leucorhiza*. Taylor calls the elaters of his plant "brevissimi," whereas in mine they are, as I have described them, "longissimi."

At Marabitanas, the frontier town of North Brazil, I gathered on wet banks by the Rio Negro, along with *Jung. heteracria* n. sp., a *Noteroclada*, which I refer doubtfully to *N. porhyrorhiza*, guided mainly by its stout red radicles; but the specimens are in such battered condition that I do not venture to describe them.

XXXVI. SCALIA, Gray, Nat. Arr. Br. pl. (1821).

Mniopsis Dum. Comm. Bot. (1823). *Gymnomitrium* Corda in Opiz. Beitr. (1829); *Haplomitrium* Nees. Hep. Eur. (1833).

Caules validi suberecti, e rhizomate flexuoso ramoso, aliis ramis flagellaribus (arhizis tamen) orti, subsimplices, ramis foliosis paucis (ubi adsint) lateralibus. *Folia* magna subtransversa tristicha, per tria subverticillata, verticillis subdissitis; f. lateralia late oblonga obovatave integra, repanda vel apice rude paucidentata; f. postica angustiora; cellulæ magnæ subæquilatero-hexagonæ leptodermes. Flores dioici: ♀ terminales, polygyni. *Bracteæ* (vix propriæ) a receptaculo sæpe remotiusculæ, foliis paulo latiores, plerumque inciso-dentatæ. *Perianthium* nullum. *Calyptra* magna, subcylindrica, multoties longior quam lata, leptodermis vel inferne carnosula, basi et paulo altius pistillidiis sterilibus obsita, demum apice,

vel uno latere, dehiscens. *Capsula* alte exserta fusiformi-cylindrica unistrata, cellulis vacuis conflata, 4-valvis, incomplete dehiscens, valvulis inter se (apice præcipue) diu cohærentibus. *Elateres* tenues arcte dispiri, pauci apicales autem monospiri cæteris diutius persistentes, omnes demum decidui. *Sporæ* minutulæ asperulæ. *Antheridia* in toto fere caule masculo bracteis dissitis apice incicis laxe vel vix operta, 3–5na, globosa aurantiaca brevistipitata.

Hab. et Distr. Species unica Europæa (in Anglia, Scandinavia et Germania boreali inventa) terram arenosam in ericetis habitat; species 2 Americæ tropicæ, altera Andina, altera Antillana (anne revera diversæ?) in arboribus putrescentibus vigent.

1. SCALIA ANDINA, Spruce.

Hab. Andes Peruvianos, in monte *Pingullu* dicto, supra pagum *Tavalosos*, alt. circiter 1500^{m}, ubi ad ligna putrida in locis cavis umbrosis humidis, sociis *Aneuris* Muscisque viget; Andes Quitenses, in sylva *Canelos*, ad truncos cariosos, alt. 1300^{m}.

Caulis sectio ·9 × ·65; *folia lateralia* 3·3 × 2·3, 3·5 × 3·0, *f. postica* 4·0 × 2·1, 3·0 × 1·35; *c* $\frac{1}{16}$–$\frac{1}{10}$; *cal* 9·0 × 1·2; *ped* 30–35; *caps* 4·5 × 1·0; *elateres* ·6–·75; *sporæ* $\frac{1}{60}$; *cell. capsulæ* $\frac{1}{16} \times \frac{1}{28} \times \frac{1}{28}^{mm}$.

Caudex repens, ad 2 pollices longus, virens, validus flexuosus intricato-ramosus, aphyllus, arhizus, caules paucos pluresve, pollicares vel altiores, suberectos, plerumque simplices, raro subramosos—ad foliorum insertionem obconico-incrassatos, necnon flagella breviuscula valida aphylla arhiza, apice mucoso matricem penetrantia eidemque arcte adhærentia, edens. Cellulæ caulis in diametro sub 18, omnes sectione fere æquilatæ et æquilatero-hexagonæ, parce chlorophyllosæ, extimæ 1–3plo longiores quam latæ, internæ multo magis elongatæ pellucidioresque.

Folia inferiora ad squamulas parvas semicirculares dissitas redacta, superiora sensim increscentia, viridia, patentia vel suberecta, insertione subtransversa, tristicha, subverticillata val saltem per tria collateralia, sc. 2 opposita, magna, obovato-oblonga, rotundata, margine undulato vel subæquali integerrima, subplana pellucida; cellulæ magnæ leptodermes hexagonæ subæquilateræ, superiores paulo minores subquadratæ.

Foliola (s. folia postica) f. lateralibus paulo altius inserta—raro basi cum altero eorum connata—angustiora, interdum sublongiora, ligulato-oblonga rotundata.—Subinde folia dislocata evadunt et inter se fere æquidistantia (nec verticillata); plerumque autem intervenit spatium sat longum inter foliorum triada consecutiva.

Flores dioici: ♀ in receptaculo terminali subnudi, foliis (vix bracteis appellandis) cæteris paulo majoribus latioribusque, interdum grosse angulato-dentatis, intermedio ligulato hinc basi connato, laxe involucrati. Pistillidia plura.

Calyptra nuda longissima, folia triplo fere excedens, clavato-cylindrica, apice in cupulam parvam corrugatam clausam (e cujus centro exseritur stylus brevis) dilatata, mollis, ad speciem carnosula, revera

solum basin versus subincrassata, basi ipsa vel paulo altius pistillidiis sterilibus obsessa, in sicco corrugato-striata. Capsula in pedicello plus minus alto suffulta, calyptrâ duplo brevior, fusiformi-cylindrica, flavida rufulave, substantia firma, cellulis tamen solum *unistratis*, elongatis subrectangularibus (pariete colorato corneo, fibris annularibus nullis); plerumque follicularis, uno solo latere dehiscens, valvulis ad cæteras suturas inter se cohærentibus. Elateres prælongi tenues subobtusi arcte dispiri. Sub capsulæ apice adveniunt elateres pauci, cæteris subbreviores, late *monospiri*, inter quas alii plurimi elateres normaliter dispiri, a pariete jam soluti, intorquati longius restant, demum autem omnes decidunt. Sporæ minutulæ, elaterum diametrum vix duplo excedentes, subglobosæ, verruculoso-striatæ.

Obs. Caulis subdichotomus, vel saltem ramis omnibus lateralibus, raro tamen e foliorum axilla ortis.

In the European *Scalia Hookeri* the capsule is sometimes cloven on one side only; rarely are all the valves completely separated, but mostly remain cohering at the apex even when free elsewhere. The capsule-wall consists of a single layer of cells, except at the apex, where an inner lining of thin cells is added. Several elaters are attached to this apical cupola, but they are equally long and slender as the others; they are either monospirous throughout, or dispirous below, but with one thread running out at about midway. All the other elaters are dispirous, and a good many of them are entangled in the apical elaters, with which they persist for a time, but soon fall away along with them.

XXXVII. SYMPHYOGYNA, Mont. Ann. Sc. Nat. (1836).

Frondes vel prostratæ, basi et per intervalla radicantes, vel e caudice prostrato radicelloso ortæ, suberectæ, subarhizæ; omnee lineares, parce dichotomæ, pagina unistrata, laxe reticulata, integerrima, serrulata, vel pinnatifida; *costa* angustiuscula, plano-convexa filo axiali lignoso opaco percursa. Raro adveniunt etiam rami postici frondulæve, subter costam primariam orti, flagella autem nulla. *Flores* omnium fere dioici: ♀ antici, subsessiles, sc. costæ facie supera insidentes. *Bracteæ* minutæ, 2–3-jugæ, tristichæ, plerumque bifidæ, vel laterales 3–5-fidæ; intimæ in cyathulum (antice apertum) alte connatæ; exteriores (ubi adsunt) angustæ, intimis ad squamularum instar adnatæ. *Pistillidia* plurima (20–70). *Perianthium* nullum. *Calyptra* maxima prælonga subcylindrica carnosa pluristrata, (strato extimo receptaculum cum calyptra maturescente sublatum sistente), sæpe mucosa, apice pistillidiis sterilibus coronata, demum irregulariter rupta. *Pedicellus* prælatus, basi calceolatus. *Capsula* calyptra subduplo brevior, subcylindrica, 4–8plo longior quam lata, cellulis unistratis lineari-quadrangulis vacuis conflata, 4-valvis, valvulis sæpe apice diu cohærentibus. *Elateres* tenues dispiri decidui. *Sporæ* minutæ. *Antheridia* ad costæ margines in

scrobiculis nidulantia, solitaria, brevistipitata, bracteâ squamæformi incisulâ fornicatâ obvelata; omnes bracteæ interdum in alam plus minus continuam connatæ.

Hab. et Distr. Species adhuc cognitæ in terris tropicis et australioribus crescunt, nulla in Europa; 4 in Andibus sylvestribus—una sola earum etiam in planitie—meipso lectæ sæpissime ripariæ videbantur, in terra saxisque necnon in truncis prostratis rivulorum aquis humectatis vigentes.

A. *Frondes prostratæ, caudice repente nullo.*

1. *S. Brasiliensis.* Frondes integerrimæ.
2. *S. Brongmartii.* Frondes pinnatifidæ-partitæve.
3. *S. leptothelia.* Frondes serratæ.

B. *Frondes suberectæ, e caudice repente ortæ.* (= *Hymenophyton* Dum.)

4. *S. Hymenophyllum.* Frondes distanter denticulatæ spinulosæve.

1. SYMPHYOGYNA BRASILIENSIS (Nees.) Mont.

Jungermania Brasiliensis, Nees in Mart. Fl. Bras.

Hab. Andes Quitenses, in M. *Altar*, ad aggeres umbrosos; in M. *Tunguragua*, in declivibus humidis: alt. 2400^{m}.

Fr. lat. 5·0; *costa* 1·5 × ·35; *c* $\frac{1}{20}$—$\frac{1}{15}$; *involl* 1·5-2·5 *alt.*; *cal* 8·0 × 1·25; *ped* 34; *caps* 4·0 × 1·1; *br* ♂ ·4 × ·6 (*v. minores*); *anth* ·3 × ·2^{mm}.

Prostrata, lurido-viridis, subinde, ad costam præcipue, purpurascens. Frondes 3^{cm} longæ, basi et hic illic radicantes, lato-lineares flexuosæ, integerrimæ, simplices v. semel bisve furcatæ, late costatæ; costa sectione semilanceolata, filo centrali lignoso tenui percursa; cellulæ limbi majusculæ subæquilateræ tenues subchlorophyllosæ. Frondes basin versus sæpe postice sub ramosæ, sc. frondulam unam alteramve prodentes.

Flores dioici: ♀ antici, e costa oriundi, pauci, solitarii, bracteâ viridi breviusculâ 3–6-fidâ, laciniis attenuatis interdum incisis, raro duplici suffulti. [Vidi etiam unicum involucrum e phyllis 6 liberis imbricatulis, apice tenuibus, sublaceris, formatum.]

Calyptra erecta, latitudine frondis longior, subcylindrica, carnosa, apice sensim rotundato pistillidiis sterilibus (20 vel sæpe paucioribus) elongatis coronata, basi stipite brevi valido suffulta. Capsula 2plo brevior cylindrico-fusiformis rufa tenuis, cellulis elongatis unistratis conflata, longipedunculata.

Planta ♂ tenuior; antheridia ad costæ margines foveolatas inserta solitaria disticha, subinde, seriebus 2 intermediis, supra costam adjectis, 4-sticha, maxima obovato-globosa, brevissime stipitata, bracteâ fornicatâ latiore quam longâ, apice lato 2–4-fidâ, subvelata, vix autem operta.

Possibly the same as *S. atronervia* Tayl. (S. H. 787), found on *Pillun*, near Cuenca, by Jameson; but Taylor says the capsule has two layers of cells, and splits (incompletely) with many valves.

2. SYMPHYOGYNA BRONGNIARTII, Mont.!

Ann. des Sc. Nat. (1843).

Hab. ad terram umbrosam super muscos repens; in truncis prostratis

cariosis; in rivulorum saxis arenaque etc., per Andes Quitenses et Peruvianos sat frequens: *Chimborazo*, *Tunguragua*, *Lamas*, etc. Ad alt. 3000^{m} usque ascendit; in montium radicibus et in ipsa planitie rarior: *Panuré* fluvii *Uaupés*, in terra; ad fl. *Negro* cataractas in monte *Serra do Gama* dicto. Crescit etiam in Mexico et insulis Antillis.

Frondis lat. 6·5; *laciniæ* 3·0 × 1·8; *costæ sectio* 1·3 × 0·3; *c* $\frac{1}{15}$—$\frac{1}{2}$; *br* 1·8; *calyptra* 18–20 × 1·6 × 1·2; *ped* 40; *caps* 8·5 × 0·8; *elateres* 0·6^{mm}.

Pallide viridis tenera prostrata. Frondes bipollicares prostratæ planæ, radicellis longis pallidis hic illic, basin versus præcipue, matrici adfixæ, bis terve dichotomæ, ramis divergentibus, lineares, pinnatifidæ; sinubus acutis rotundatisve plerumque profundis, ad paginæ $\frac{3}{4}$ lat., interdum solum ad $\frac{1}{4}$—$\frac{1}{2}$ lat.; segmentis approximatis rhomboideis oblique truncatis, raro rotundatis, repandis rarius angulato-denticulatis; cellulæ magnæ subæquilateræ leptodermes parum chlorophyllosæ; costa lata plano-convexa, sectione semilanceolata, e cellulis pluristratis, externis subopacis, conflata, filo lignoso tenui, infra dichotomias duplici, ad axim percursa.

Flores dioici: ♀ antici, costæ facie superiore hic illic apiceque insidentes. Bracteæ minutæ, 3 interiores basi connatæ, bifidæ; exteriores ad squamulas lanceolatas, ex p. interioribus adnatas, redactæ. Pistillidia plurima (ad 60 numeravi).

Calyptra longissima, bracteas 10plo superantia, albida erecta, anguste tubulosa, compressula, cellulis 6-stratis pellucidis conflata; papillis minutis, 2–3 cellulas longis, tota superficie, basin versus præcipue, sparsa, necnon strato denso mucoso tecta, apice pistillidiis sterilibus coronata. Pedicellus duplo longior pallidus tener, basi excipulo obconico obscure limbato receptus. Capsula calyptra 2½plo brevior, lineari-cylindrica, rufa, tenuis, cellulis unistratis, linearibus pro m. truncatis, conflata, valvulis 4 liberis vel apice aliquamdiu cohærentibus. Elateres elongati tenues dispiri decidui. Sporæ minutæ elateribus vix duplo latiores.

Var. *pinnatipartita*: elatior, 3–4-pollicaris, sæpe simplex vel semel furcata. Frondes ad costam fere usque pinnatipartitæ; pinnæ basi subdissitæ, superne latiores et subimbricatæ, breviter bilobæ, vel 3–4-lobulatæ, raro ex rotundato truncatove apice apiculatæ, margine angulatæ et subdenticulatæ. Calyptra prælonga (22^{mm}). Pedicellus 60^{mm} longus. (=Symph. *pinnatipartita* Mst., forsan pro specie habenda).—In trunco putrescente montis *Guayrapata*, alt. 2800^{m}.

Var. *rigidiuscula*, humilis, bis terve dichotoma. Pinnæ subimbricatæ, abruptæ apiculatæ, denticulatæ. Bracteæ laterales 3–5-fidæ, cum media 2-fida in cyathulum involucrale 8–12-fidum connatæ. Calyptra valde mucosa.—*Tunguragua*, in trunco carioso, alt. 2400^{m}.

3. SYMPHYOGYNA LEPTOTHELIA, Tayl.

Lond. Journ. Bot. (1846); G. L. et N. Syn. Hep. p. 786.

Hab. Andes Quitenses, ad fl. *Bombonasa* in terra humida; pl. ♂ sola. Prope *Casapi* Peruviæ detexit cl. MATHEWS plantas ♂ et ♀, cum fructu.

Frondis lat. 3·0; *c* $\frac{1}{24}$; *anth* ·15^{mm}.

Prostrata pallida, ad costam purpurascens, siccando fusca. Frondes 2–3^{cm} longæ, radicellis pallidis longis compressis matrici basi præ-

cipue adhærentes, lato-lineares, plerumque furcatæ, raro simplices, interdum ramum posticum proferentes, basin versus sæpe rotundatæ (itaque stipitatæ videantur), toto ambitu distanter spinuloso-serratæ, dentibus antrorsum directis 2–3 cell. longis, basi 2 cell. latis; costa lata, crassiuscula, subtus carinata, intus filo lignoso opaco percursa; cellulæ majusculæ subpellucidæ.

Antheridia in costæ locellis parum profundis interrupte 2–4-seriatis solitaria, majuscula subglobosa bracteâ parvâ bi-trifidâ concavâ stipata. Subinde advenit bractea major, 2 bracteis connatis constans, antheridia 2 (singulo tamen in suo proprio locello) obtegens.

A *S. Hymenophyllo* fronde prostrata radicellosa distat, necnon (fide Taylori, quum fructum ipse nondum vidi) calyptra longe obovata.

4. SYMPHYOGYNA HYMENOPHYLLUM (Hook.) Mont.?

Jungermania Hymenophyllum Hook. Musc. Exot. t. 14?

Hab. Var. *heterogena* S. ad *Tarapoto*, in rivuli saxis irrigatis.

Fr. lat 4·0; *costa* ·7; *cell* $\frac{1}{16}$; *inv* 1·9; *pistil* ·7^{mm}.

Viridis, siccando fuscidula. Rhizoma tenue repens radicellosum, plus minus alatum. Frondes suberectæ, 5^{cm} longæ, bis bifidæ; laciniæ sæpe elongatæ, lineari-lanceolatæ, emarginatæ, flexuosæ undulatæque, valde distanter denticulatæ spinulosæve; costa latiuscula tenuiuscula, 3c. crassa, filo centrali lignoso valido dichotomias versus duplici percursa, subtus plus minus radicellosa; cellulæ majusculæ subæquilateræ subpellucidæ.

Flores dioici: ♀ ad furcas necnon hic illic ad medias lacinias, 3 circiter cujusque laciniæ, positi, stipite perbrevi valido carnoso suffulti. Bractea ad medium usque 3–6-fida, laciniis subulatis caudato-acuminatis incurvis, subinde hinc vel utrinque basin versus 1-bidentata, extus bracteolis parvis adnatis forma variis sæpe lanceolatis integerrimis v. subincisis aucta. Pistillidia plurima (50–60), prælonga.

Obs. This agrees so well in its vegetative organs with Hooker's figure, above-quoted, that it can hardly be any other species. As I did not find it in fruit, and have seen no fertile New Zealand specimens, I cannot venture to say whether Dumortier's genus *Hymenophyton*, framed to contain Hooker's *Jungermania flabellata* and *J. Hymenophyllum*, is tenable by any good character; for the ♀ flowers springing from the forks of the frond, as in normal forms of those species, are combined in my specimens with lateral (antical) flowers, about 3 on each lacinia, as in typical species of *Symphyogyna*. The dendroid stems, arising from a creeping caudex, is a good *prima facie* distinction, but if no other exist, I suppose we must hold *Hymenophyton* to be a mere section of *Symphyogyna*. Moreover, in the preceding species, *S. leptothelia*, the fronds, although quite like those of *S. Hymenophyllum* in texture and in the toothed margin, are prostrate and closely rooting, nor is there anything tree-like about them; so that even that distinction fades away.

XXXVIII. PALLAVICINIA, Gray.

Nat. Arr. Brit. Pl. (1821). *Dilæna* Dum. Comm. Bot. (1823). *Blyttia* Endl. (1840); Syn. Hep. (1846).

Genus cum Symphyogyna convenit aspectu; fronde valide costata

(sæpius autem facie postica ramosa, rarius apice furcata); situ antico florescentiæ tam ♂ quam ♀; antheridiis solitariis, ad costæ margines uniseriatis, bracteatis; involucro ♀ eidem *Symphyogynæ* persimili, revera bracteis 2–3-seriatis, varie fissis, in cyathulum plus minus arcte connatis constante; differt autem præsentia *perianthii* magni tubularis carnosi, ore ciliolati. *Calyptra*, eadem fere forma ac *Symphyogynæ*, tenuior est, solum infra medium carnosula et pistillidiis sterilibus (sub 20) sparsa—nec apice ipso pistillidiis coronata. *Capsula* tenui-cylindrica, unistrata, valvulis 4 sæpe incomplete dehiscentibus. *Elateres* et *sporæ* cum iis *Symphyogynæ* exacte fere congruunt.

Hab. et Distr. Species forsan solitaria huic generi recte adscripta, per orbem terrarum rarius dispersa, loca humida umbrosa tam calida quam frigidiuscula diligit.

1. PALLAVICINIA LYELLII (Hook.) Gray.

Jungermania Lyellii Hook. Brit. Jung. t. 77.

Hab. In humidis umbrosis ad truncos putrescentes saxaque, rarius in ipsa terra, in Andium orientalium radicibus sat frequens et fertilis: *Canelos*, *Tavalosos*, *Guayrapurina*, &c., raro supra 1000 metra ascendens; in planitie hic illic in statu solum sterili observata fuit.—Stirps cosmopolitana, nullibi autem copiosa.

Frondes 30×4–6; *c* $\frac{1}{16}$–$\frac{1}{8}$; *costæ sectio* ·85×·35; *involucrum* ♀ 1·5 *altum; per* 10·0×1·3; *pedicellus* 35; *capsula* 4·0×·8, *cellulæ* $\frac{1}{8}$ *longæ; pistillidia* ·6; *involucrum* ♂ ·4^{mm} latum.

Frondes in plagas latiusculas extensæ, vix stratificatæ, pallide virides, flavicantes vel lurido-purpurascentes, subpollicares, simplices vel frondulas 2–4 e facie postica basin versus proferentes, obovato-ligulatæ vel breviores et subovatæ, apice emarginatæ rarissime semel furcatæ, basi sensim vel abrupte angustatæ radicellis villosæ (ideo caudicem repentem alatum simulantes), superne a matrice plerumque liberæ arhizæ, undulatæ, valide costatæ integerrimæ vel subserratæ. Cellulæ paginæ magnæ oblongo-hexagonæ, leptodermes pellucidæ, fere vacuæ. Costa plano-convexa, subtus alte rotundata, filo axiali nigro lignescente, cellulis pluristratis angustissimis constante, percursa.

Flores dioici: ♀ antici, sæpe 2 plus minus dissiti cujusque frondis costa medium versus insidentes. Bracteæ in involucrum alte cupulare, fertile carnosum, sterile tenuius, ore in lacinias ciliiformes plurifidum, demum perianthii basin arcte amplectens, connatæ. Pistillidia 20, prælonga.

Perianthium erectum lineari-cylindricum carnosum, inferne 5 cellulas crassum, ore subconstricto lobato-ciliolatum. Calyptra paulo brevior angustiorque rufula superne tenuis, a basi ultra medium 2–3c. crassa et pistillidiis sterilibus sparsa, apice irregulariter rupta. Pedicellus elongatus, totam frondem excedens, pallidus tenellus. Capsula calyptra duplo brevior, subcylindrica, 5plo longior quam lata,

4-valvis, vel sæpius, valvulis per paria apiceque cohærentibus, solum 2-valvis, tenuis; cellulæ unistratæ lineares, apice sæpe truncatæ, aliæ autem acutæ, fibra spirali omnino carentes.

Plantæ ♂ tenuiores. Antheridia majuscula subglobosa stipitata, solitaria, in scrobiculis frondis juxta costam seriatis nidulantia; bracteis ad costæ margines utrinque in alam plus minus continuam, plurilobatam (lobis spinulosis) connatis obvelata.

Formas plurimas legi, omnes caracteribus minoris momenti a typo divergentes. Ad *Saõ Gabriel do Rio Negro* forma adest frondibus prælongis magis ramosis, per intervalla angustatis ad costam fere redactis, colore lurido. Involucrum ad basin fere usque pluripartitum, laciniis subpalmatipartitis angustissimis. In sylva *Canelos* advenit fronde basi longe repente ad costam redacta vel anguste alata; frondibus partialibus eodem modo inferne longe angustatis, quasi-stipitatis.

Stirps Britannica (e specim. ab ipso Hookero!) cum Andina bene convenit. Frondes fertiles breviusculæ. Bracteæ ♀ in involucrum altiuscule connatæ, palmatifido-laciniatæ.

XXXIX. MONOCLEA, Hook. Musc. Exot. (1820).

Frondes validæ cuneatæ anguste dichotomæ, costa prælata et crassa, ad margines in paginam angustam sensim attenuata, subtus radicellis villosa. *Flores* dioici: ♀ terminales, in laciniarum costa ab apice profunde excavata nidulantes, involucro proprio nullo. *Pistillidia* 1–3, omnia fertilia: (sterilia nulla vidi, anne igitur adsint?) *Calyptra* libera, cavitati exacte æquilonga, compresso-cylindrica, apice demum labiis duobus dehiscens. *Capsula* in pedicello longiusculo magna, oblongo-cylindrica, cellulis unistratis vacuis conflata, 4-valvis, hinc tamen solum longitudinaliter dehiscens, valvulis cæterum inter se cohærentibus vel tantum ipso apice hiantibus. *Elateres* longissimi dispiri. *Sporæ* minutissimæ asperulæ. *Andrœcia* . . .

Hab. Ad saxa rivulorum emersa, locis montanis umbrosis. *Distr.* Speciei typicæ, a FORSTER in insulis australibus lectæ, 'Musc. Exot.' l. c. delineatæ, exemplaria authentica nondum vidi. Nostra Andina cum Hookeri figura et descriptione satis convenit, si attamen diversa fuerit forsan ad *M. Gottschei* Lindberg. referenda. *Monoclea* tertia ex Antillis advenit, a me nonnisi in statu sterili visa, ex habitu autem distincta videretur.

1. MONOCLEA FORSTERI, Hook.?

Musc. Exot. t. 174.

Hab. Andes Peruvianos, ad rivulorum saxa lignaque in monte *Guayrapurina*, alt. 1000^{m}; Andes Quitenses, in saxis fluvii *Pastasa* irrigatis. Brasilia borealis, ad rivulorum saxa in monte *Serra do Gama* dicto prope fl. *Negro* cataractas. In Mexico invenit LIEBMANN.

Frondis cellulæ $\frac{1}{15}$–$\frac{1}{8}$; *costa* 14 *cell.*, *limbus* 4–1 *cell. crassit.*; *cal* 8·0 × 1·3; *ped* 15–30; *caps* 5·5 × 1·1, *cell* $\frac{1}{8}$–$\frac{1}{5}$; *elat* 1·6^{mm}.

Prostrata, olivaceo-viridis, habitu Marchantioideo. *Frondes* 5–6^{cm} longæ, ambitu subcuneatæ, apicem versus subflabellatim bis dichotomæ, furcis valde acutangulis, inferne 10^{mm} latæ, superne furcas versus dilatatæ, laciniis duplo angustioribus; carnosæ, obscure lateque costatæ, medio 14 cell. crassæ, marginem versus sensim attenuatæ, in ipso margine 1–4 cell. crassæ, supra læves nudæ, subtus radicellis prælongis appressis villosæ; cellulæ tenerae, superficiales magnæ oblongo-hexagonæ opacæ chlorophyllosæ, interiores magis pellucidæ.

Flores dioici: *Fructificatio* in laciniarum costa ab apice profunde excavata recepta. *Perianthium* nullum. *Calyptra* albida, omnino immersa, libera, ore inæqualiter bilabiato cum frondis apice contermina, centimetrum fere longa, tubularis, a fronte compressula, faciebus 2 cell. crassa, utrinque margines versus sensim incrassata, ad acies 5–7 cell. crassa. *Pedicelli* (sæpissime bini) plus minus alte exserti pallidi crassiusculi. Capsula dimidiam calyptram excedens oblongo-cylindrica, rufo-fusca, erecta, curvula, facie convexa longitudinaliter dehiscens, interdum apice breviter trifida; cellulis unistratis magnis linearibus, truncatis acutisve, intus fibris annularibus crebris repletis, conflata. *Elateres* longissimi tenues arcte dispiri, decidui. *Sporæ* elateribus vix duplo latiores, globosæ, minute asperulæ.

Andrœcia non inveni.

Subtribus VIII. METZGERIEÆ.

Plantæ frondosæ, pinnatim vel dichotome ramosæ, pinnis laciniisve linearibus, in die solum e generibus duobus constantes. *Frondes* in altero genere (*Aneura*) carnosæ; costa—lacinularum saltem, interdum etiam primaria—lata, intus valde laxe cellulosa, utraque facie cellulis corticalibus minoribus operta, paginâ lineari plerumque alata, subtus plus minus radicellosa. In altero (*Metzgeria*) frondes membranaceæ; costa ubique angusta, cellulis internis parvis, corticalibus magnis pellucidis, conflata; radicellas e margine costaque—subinde e tota superficie, inferiore præcipue, proferentes. *Flores* dioici, rarius autoici, rarissime paroici. *Rami floriferi* breves, in *Aneura* laterales, in *Metzgeria* postici. *Genitalia* utriusque sexus in receptaculo (i.e. ramuli costâ abbreviatâ) disticha—solum in *A. latissima* organa ♂ tetrasticha inveniuntur—subcontigua, 2-20-raro plurijuga; *pistillidia* plerumque pauciora, cylindrico-subulata, astyla; *antheridia* sæpissime in diversa stirpe, vel saltem in ramo distincto, globosa, majuscula, in *Metzgeria* stipite unicellulari insidentia, in *Aneura* in alveolis biseriatis sessilia. *Perianthium* nullum. *Calyptra* magna subclavata, carnosa, ramuli fertilis limbo basi breviter involucrata, pistillidiisque sterilibus circumdata, superne sæpius vel papillosa vel (in *Metzgeria*) radicellis hirta. *Capsula* plerumque brevipes, subcylindrica vel ovalis, ad basin usque 4-valvis, bistrata,

cellulis internis helicem plus minus completam, vel obsoletam, includentes. *Elateres* monospiri, utroque fine tenues peracuti, helice latâ planâ; alii autem apicales breves, rigidi, helice incompletâ farcti, diutius persistentes et cum nonnullis normalibus intexti in penicillos quatuor porrecti: omnes demum decidui. *Sporæ* minutæ, lævis vel vix asperulæ.

40. ANEURA. Frondes semper fere pinnatim ramosæ, carnosæ, costa lata sæpe a pagina haud facile distinguenda, radicellis solum hypogenis. Flores in ramis lateralibus. Calyptra lævis vel papillosa. Capsula subcylindrica. Andrœcia alveolata.
41. METZGERIA. Frondes dichotomæ rarissime pinnatæ, tenues, costa bene definita, radicellis ad margines, subter costam, sæpe etiam ad paginam, plus minus pilosæ. Flores in ramis hypogenis. Calyptra hirta. Capsula ovalis. Andrœcia plana.

The plants here brought together as a subtribe have almost as much right to be regarded a distinct tribe, separated from *Jungermanieæ* by the constantly monospirous elaters, and by the distinctly distichous arrangement not only of the male but also of the female organs, on their several receptacles. There is, however, no dilatation of the apex of the pedicel comparable to that of the *Jubuleæ;* and the elaters, although monospirous, are not permanently fixed to the capsule by one extremity and truncate at the other, as in *Jubuleæ*. And as to their other characters, nearly all are paralleled in certain of the genera grouped under the previous subtribe, *Fossombronieæ;* while the habit is often very like that of *Symphyogyna* and *Pallavicinia*.

The two genera, *Aneura* and *Metzgeria*, constituting the subtribe *Metzgerieæ*, are themselves separated by such marked characters that some authors have relegated them to distinct tribes; while in the 'Synopsis Hepaticarum' certain species of *Aneura* are confounded with *Metzgeria*, for want of observing the constant character of the purely lateral ramification of *Aneura*, whereas in *Metzgeria* all the flowering branches are postical. The inflorescence and fructification are, however, so essentially alike in both genera that in a natural arrangement the two must always stand side by side. [See further my remarks under *Aneura*.]

XL. ANEURA, Dumort.

Riccardia Gray, Nat. Arr. (1821) pro parte; *Aneura* Dum. Comm. (1823); *Acrostolia* Ejusd. Recueil. (1835); *Pseudoneura* Gottsch. Mex. Leverm. (1863).

Plantæ late depresso-cæspitosæ, carnosulæ, raro amœne virides, plerumque lurido-virides-purpurascentesve, in sicco sæpe nigricantes. *Frondes* vel prostratæ, radicellis matrici arcte adhærentes, pinnatifide ramosæ, ramis alternis; vel e rhizomate radicelloso ramoso, interdum flagellifero, ortæ, assurgentes, bi-tripinnatæ, pinnis (primariis saltem) oppositis, apice (in sicco præcipue) pro more decurvis. Caulis, sive *costa* primaria teres vel plus minus compressa, ubique,

vel solum apicem versus—in plerisque nullibi—alata; in his ultimis saltem pluristrata, cellulis subconformibus vel corticalibus subminoribus et brevioribus conflata. *Pinnæ* pinnulæque lineares, raro omnino exalatæ, plerumque medio late tenuicostatæ, utrinque limbo unistrato, vel ex p. bistrato, costæ æquilato vel angustiore, alatæ. *Cellulæ* limbi, idem ac costæ superficiales, majusculæ—parvulæ, subæquilatero-hexagonæ vel parum oblongatæ, plus minus chlorophyllosæ; cellulæ costæ internæ 2–4plo majores elongato-hexagonæ, pro more inanes. *Flores* dioici, rarius monoici. *Andræcia* ramulos abbreviatos sistentia; costa ramuli utrinque foveolis 2–20, raro pluribus, uniseriatis—in *A. latissima* sæpe biseriatis—antheridia solitaria magna globosa subsessilia foventibus excavata, limbo lineari crenato vel plurilobulato erecto-incurvo, involucri vicibus fungente, utrinque obducta. *Gynæcia* ramulos (in speciebus pinnatis sæpe pinnulas 2 cujusque pinnæ infimas), masculis similes sed breviores, sistentia. *Pistillidia* ad costulam utrinque uniseriata, 2–8-juga (in *A. hymenophytoide* usque ad 20-juga vidi) sessilia brevia subcylindrica astyla, unico (sæpe terminali) fertili; involucrum masculo simile, sæpissime autem lamellis utrinque duabus ad costam usque incisis, segmentis exterioribus cum interioribus alternantibus, omnibus plerumque iterum laciniatis, laciniis angustis flexuosis, constans. (Ramulus ♀ ubi fertilis persæpe brevissimus; ita ut involucrum fructûs, ad squamæ formam redactum—subinde deorsum gibbum, raro autem radicans—cum pistillidiis sterilibus calyptræ basin circumstans videtur.) *Perianthium* nullum. *Calyptra* magna, plus minus clavata, carnosa, recens persæpe mucosa, in quibusdam papillosa, apice (in omnibus?) papillis paucis magnis, liberis vel inter se in umbonem coadunatis, coronata. *Pedicellus* brevis cellulis axialibus 4-seriatis, corticalibus plerumque 12-seriatis, constans, basi calceolatus. *Capsula* magna, oblongo-cylindrica, angusta, plus duplo (in *A. latissima* 5plo fere) longior quam lata, ad basin usque 4-valvis; bistrata, cellulis lineari-rectangulis, interioribus fibra raro perfecte spirali, plerumque disrupta—annulari vel semiannulari—repletis. *Elateres* capsula 2–4plo breviores, prælate laxe monospiri, utroque fine capillacei; alii autem (*elaterophori*) sub valvularum apice diu persistentes, breves, claviformes vel subcylindrici, spiram incompletam sæpe annularem includentes, primum devexi, capsulâ apertâ assurgentes et cum aliis multis elateribus normalibus intricati in penicillos 4 porrecti. *Sporæ* minutæ elateribus vix æquilatæ, læves vel minutissime asperulæ.

Hab. Aneuræ, inter hepaticas præprimis saproxylophilæ, etiam in

terra humida umbrosa et ad saxa rivulorum vigent. Ubique terrarum inventa sunt. In sylvis Amazonicis et Andinis ad truncos prostratos putrescentes, sæpe muscis irrepentes, valde abundant; species autem caracteribus difficillime eruendæ, propterea nullam Amazonicam cum Antillanis, etc. identificare potui.

The existence of a costa, or nerve, in *Aneura* is undeniable, and in the robuster species the primary costa, or stem, is almost terete, and consists of many concentric strata, whose structure is not sensibly different from what obtains in other hepaticæ. But the costa in the ultimate, and often in the penultimate, divisions of the frond usually becomes thin and broad, and (contrary to the normal proportions in other genera) the inner layers consist of much larger and more pellucid cells than those of the superficial layers, whose lateral extension—that of the upper surface especially—constitutes the wing or pagina which exists in nearly every species.—The transition from species usually (but erroneously) regarded as quite destitute of a nerve to those where its existence is undisputed is so gradual that the supposed genus *Acrostolia* Dum. (*Pseudoneura* Gottsch.), framed for the reception of the strongly-nerved species, is inadmissible even as a subgenus.

The ♂ and ♀ receptacles are abbreviated pinnules, or branchlets, having the same lateral origin as the efloriferous pinnules. Both antheridia and pistillidia are solitary, and inserted in two rows, one row on each side of the upper face of the costa of the pinnules; the antheridia in little pits (alveoles) on the very margin, the pistillidia sessile a little within the margin of the costa; and they are partially veiled (involucrate) by the incurved, and often deeply laciniate, wings of the pinnule. I have not seen the two sexes united on the same receptacle, although that is said to sometimes occur in the European *A. palmata*; but it is singular that, while the involucre of the antheridia is single, that of the pistillidia is usually double, or bilamellate, each of the twin lamellæ being besides more deeply cut, with more numerous and narrower laciniæ, than the ♂ involucre. Possibly, in some anterior synoicous condition of the *Aneureæ*, the outer of the two lamellæ may have subtended the antheridia. The involucra that contain only sterile ♀ flowers are often very little shortened, and show the distichous arrangement of the pistillidia very clearly; but where one of the latter has been fertilised, and has grown out into a calyptra, the short involucre surrounds its base like a cup, and although its duplicate character may be detected, the bilateral insertion of the sterile pistillidia that still adhere to its costa becomes indistinct. The antheridia vary from 2 to 12 pairs, rarely as many as 20 pairs, except in *A. latissima* n. sp.—the only species that has the antheridia mostly in a double row on each side of the costa—where they are sometimes very numerous. The pistillidia are usually fewer, from 2 to 8 pairs; but I have once found as many as 20 pairs in *A. hymenophytoide* n. sp.

J. B. Jack* has given the name of "Elater-holders" (*Schleuderträger*, or *Elateren-träger*) to the short stout claviform elaters that persist in the apices of the capsule-valves, and hold each a pencil of twisted intricate slender-fusiform free elaters in mechanical (not organic) attachment; although all finally fall away, and leave the valves quite naked within.

* In his Review of Dumortier's 'Hepaticæ Europæ': Bot. Zeit. 1877.

A. *Frondes fere planissimæ, subtus ad costam latam tenuem* (3, *raro* 4, *cellulas medio crassam*) *vix convexulæ.*

1. *A. latissima.* Dioica, prostrata, matrici ubique appressa, prælate ligulata sinuato-pinnatifida; costa prælata, c. 3 medio crassa. Calyptra prælonga glabra nisi pro papillis paucis apicalibus. Capsula 5plo longior quam lata, cylindracea. Antheridia utplurimum 4-seriata.
2. *A. leptophylla.* Monoica, pusilla pallida, flabellatim bis divisa, laciniis lato-linearibus tenuicostatis late limbatis. Calyptra clavata apice alte mammillata, sub apice papillosa. Antheridia biseriata.
3. *A. tenuicula.* Dioica, pusilla pallida, vage sinuato-bipinnatifida; costa sat lata, tenui; limbo inferne angusto superne costæ æquilato. Calyptra clavato-cylindrica superne obscure tuberculosa, mammilla apicali cito caduca.

B. *Frondis caulis s. costa primaria alte plano-convexa, biconvexa, vel subteres.*

a. *Costa ab ipsa basi plus minus late alata.*

* *Frondes integerrimæ vel solum repandæ.*

4. *A. amazonica.* Dioica, pusilla rufescens inæqualiter bipinnatifida; costa primaria plano-convexa 5 cell. crassa; pinnulæ lato-lineares celluloso-subcrenulatæ, limbo utrinque costæ subæquilato. Calyptra clavato-cylindrica papillosa, apice alte mammillata.
5. *A. pectinata.* Monoica pusilla rufescens bipinnatipartita, pinnis subflabellatim pinnulatis; costa primaria basi subteres, c. 8 in diametro, pinnularum tenuis, utrinque late limbata. Calyptra sat magna, clavata, valde carnosa, solum superne subtuberculosa, mammilla apicali crassa.

** *Frondes subserrulatæ vel ciliolatæ.*

6. *A. trichomanoides.* Dioica, mediocris, bipinnatipartita; caulis biconvexus, medio 8 c. crassus, late interrupte alatus, ala interdum spinulosa; pinnulæ subcontiguæ lato-lineares late alatæ, superne serrulatæ.
7. *A. ciliolata.* Dioica, elata, primum dichotoma, dein bipinnata; costa valida pluristrata, solum supra medium alâ interruptâ ciliatâ marginata; pinnulæ lato-lineares, laticostatæ, anguste alatæ, toto margine ciliolatæ.

b. *Costa primaria exalata, vel tantum hic illic rudimentarie alata, pinnæ autem pinnulæque ubique alatæ.*

8. *A. pallida.* Dioica elata tenuis bipinnata; costa subplano-convexa c. sub 8 crassa; pinnæ dissitæ breviusculæ, medio 6c. crassæ; pinnulæ 3-jugæ, 4c. medio crassæ, limbo perangusto pellucido. Calyptra pyriformi-clavata parum tuberculosa.
9. *A plumæformis.* Dioica elata robusta tripinnata, caule subtereti pluristrato; pinnulæ subcontiguæ lato-lineares, costa 3–4c. crassa, limbo 4–6c. lato, reti laxiusculo.
10. *A. andina.* Dioica humilis bi-tripinnata, caule compresso-tereti, c. 12 in diametro; pinnæ anguste alatæ, pinnulæ limbo utrinque costæ subæquilato. Calyptra magna subcylindrica breviuscule papillosa.
11. *A. hymenophytoides.* Dioica, humilis, palmatim pinnata; pinnæ paucæ, raro furcatæ, lato-lineares, tenui-costatæ, cellulis marginalibus parvis. Calyptra clavata, densius papillosa.

12. *A. lepidomitra.* Dioica, elatiuscula bipinnata, caule biconvexo, 6–7c. crasso, hic illic subalato; pinnulæ pancijugæ sublineares, late limbatæ, costa superne angustiore. Calyptra clavata squamulis membranaceis conspersa.

c. *Costa primaria pinnæque omnes exalatæ, ramulis ultimis peranguste alatis interdum exceptis.*

13. *A. macrostachya.* Pusilla, *A. amazonicæ* similis, minor, divisionibus omnibus (laciniis ultimis exceptis) exalatis; spicis ♂ prælongis, &c. distat.

14. *A. cervicornis.* Dioica, mediocris, rigidula, algoidea, tripinnata, ramis in sicco circinatis; caulis subteres pluristratus; pinnæ omnes subexalatæ, pinnulæ attenuatæ. Calyptra magna clavata tuberculata. Spicæ ♂ breves.

1. ANEURA LATISSIMA, Spruce.

Hab. in truncis cariosis juxta *S. Gabriel*, fluvii *Negro*; etiam in ripis flum. Amazonum paulo intra fines Peruviæ.

Frons et laciniæ 3–8^{mm} *latæ*; *cellulæ* $\frac{1}{12}$; *androecia* 2–4; *calyptra* 6·0 × ·8, 5·0 × ·75; *capsula* 3·0 × ·65, 2·25 × ·5^{mm}.

Viridis flaccida in latas plagas prostrata. Frondes 2–3-pollicares, $\frac{1}{8}$–$\frac{1}{3}$ pollicis latæ, planæ, prælate ligulatæ, sinuato-pinnatifidæ, lobis latis brevibus, subtus radicellis alicubi matrici necnon inter se adhærentes; costa lata (=frondis $\frac{1}{2}$), tenuis, 3 cellulas crassa; pagina 1–2 cell. crassa; cellulæ magnæ elongatæ leptodermes opacæ.

Flores dioici: ♀ ramulo abbreviato constantes. Pistillidia pauca, squamulâ brevi emarginatâ fimbriatâ suffulta.

Calyptra prælonga, cylindrica, albida, tenuis (basi 3–4 cell., apice 2 cell. crassa) submucosa, apice papillis paucis longis patulis coronata, in sicco rugoso-striata. Capsula duplo brevior, cylindracea bistrata, cellulis internis fibra tenui perfecte spirali repletis. Elateres prælongi (1·25^{mm}), fere recti, fibra spirali lata simplice farcti.

Plantæ ♂ amentis (sc. frondis laciniis transformatis) pinnulatæ; amenta solitaria vel 2–3na; frondis latitudine paulo breviora, tota facie supera foveolata; foveolæ plurijugæ, 2–4-seriatæ, primum ad speciem clausæ, serius limbo angusto eroso assurgente marginatæ; antheridia solitaria maxima subsessilia.

Ab *A. sessili* Spreng. distat fronde prælata tenuissima, in sicco membranacea; calyptra apice digitatim papillosa; antheridiis sæpe 4-seriatis, etc.

2. ANEURA LEPTOPHYLLA, Spruce.

Hab. San Carlos del Rio Negro (Venezuelæ australis) in arboris cortice carioso.

Fr. laciniæ ·2–·5^{mm} latæ; cellulæ internæ $\frac{1}{10}$, marginales $\frac{1}{24}$–$\frac{1}{20}$; calyptra 1·5 ad 2·0 × 0·3 ad 0·4^{mm}.

Pusilla tenella albicans pellucida arcte stratificata. Frondes $\frac{1}{4}$–$\frac{1}{3}$ pollicis longæ, prostratæ, flabellatæ, primum subpinnatifidæ, pinnis paucis, superioribus basi prælatis dein palmatipartitis (quasi bis terve dichotomis), tenuissimæ, medio cellulas 3 (raro 4) crassæ; costa angusta, raro plus quam 2 vel 3 cellulas lata, infra laciniarum apicem sæpe evanescens, limbo utrinque 3–5 cell. lato; cellulæ mediæ (interuæ)

magnæ oblongo-hexagonæ, marginales duplo minores inæquilateræ convexo-prominulæ (unde laciniæ crenulatæ evadunt).

Flores monoici, raro dioici: ♀ ramo brevi sistentes. Involucrum angustum subduplex digitifidum, interius basi calyptræ plus minus alte adnatum.

Calyptra pallida clavata, inferne 4 cellulas, apicem versus 2 cell. crassa, apice alte mammillata, sub apice papillosa, cæterum sublævis. Capsula cylindrico-oblonga.

Amenta ♂ ramulum abbreviatum sistentia; alveoli 8-jugi, limbo angusto incurvo involucrati.

Aneura tenuicula certe differt florescentia dioica, fronde viridiore sinuato-bipinnatifida, magis valide costata, margine vix celluloso-crenulata, mammilla calyptræ decidua.

3. ANEURA TENUICULA, Spruce.

Hab. in truncis prostratis cariosis prope flum. Amazonum ostia, loco *Tauaú*, etiam secus fluvios *Negro*, *Uaupes* et *Huallaga*.

Frondis laciniæ 0·4^{mm} latæ; cell. costales $\frac{1}{8}$, marginales $\frac{1}{24}$^{mm} latæ; calyptra 1·6 × ·4; capsula ·55 × ·25^{mm}.

Pusilla pallide viridis prostrata. Frondes 4^{mm} longæ, planæ, vage sinuato-bipinnatifidæ, costa primaria 5 cell. lata, medio 3–4 cell. crassa, limbo variabili inferne perangusto, ad lacinias breves autem costæ æquilato, subpellucido; cellulæ internæ (costales) magnæ elongatæ subchlorophyllosæ; limbi marginales triplo minores, inferiores lineares haud prominulæ, superiores subglobosæ convexulæ.

Flores dioici: rami ♀ breves; pistillidia sub 6 paria, conferta. Bractea fructûs annulari-cupularis digitatim plurilaciniata.

Calyptra clavato-cylindrica, albida flavidave, inferne 4 cellulas, apice 2 cell. crassa, apicem versus obscure tuberculosa lævisve, mammilla apicali cito caduca. Capsula alte exserta, cylindrico-oblonga, valvulis lineari-lanceolatis.

Andrœcia brevia, alveolis antheridiisque 2–6-jugis.

Obs. Cellulæ internæ 5–6-seriatæ, unistratæ—interdum duplo numero et bistratæ, cellulis superficialibus 2–4plo minoribus tenui strato opertæ; limbus ad caulem inferiorem sæpe subnullus, ad lacinias autem costæ subæquilatus. Planta ad fl. *Huallaga* ripas lecta viridior est, magis elongata, serpentina, valde inæqualiter ramosa, arcte intexta. Stirps Uaupensis pallidior est, pinnatifida, laciniis cuneato-oblongis bifidis trifidisve. Plantæ ♂ cum ♀ mixtæ, easdemque arcte amplectentes.

4. ANEURA AMAZONICA, Spruce.

Hab. per totam sylvam Amazonicam, in truncis prostratis semiputridis, frequens; sc. prope *Pará*; ad *S. Gabriel* et *S. Carlos* in fluvii *Negro* ripis, &c.

Laciniæ frondis ·4–·8^{mm} latæ; *cell. internæ* $\frac{1}{16}$–$\frac{1}{12}$, *marginales* $\frac{1}{32}$; *bracteæ* ♀ ·3; *calyptra* 2·0 × 0·4^{mm}.

Pusilla, rufescens vel rufo-viridis, prostrata intricata et substratificata. Frondes $\frac{1}{4}$–1-pollicares inæqualiter bipinnatifidæ-partitæve, interdum ex p. dichotomæ, latiusculæ, plano-convexæ, hic illic, sub laciniarum apice præcipue, tomentum radicellosum proferentes. Caulis ubique

fere alatus, inter pinnas cuneato-dilatatus, ad axin sub 5 cellulas crassus. Pinnæ *oppositæ*—superiores raro subalternæ—aliæ sæpe inordinatim elongatæ; pinnulæ paucæ, lineares, repandæ, parum celluloso-crenulatæ, apice obcordatæ, costa utrinque limbo eidem æquilato vel angustiore marginata. Cellulæ laciniarum costæ internæ 1–2-stratæ, cujusque strati sub 6-seriatæ, magnæ, elongato-hexagonæ, sæpius acutæ, cellulis superficialibus duplo angustioribus, subæquilateris vel paulo elongatis, in tenui strato obtectæ; c. limbi sensim minores æquilateræ, ipsæ marginales multo minores subquadratæ convexulæ; omnes cellulæ leptodermes pellucidæ.

Flores dioici: ♀ receptacula linearia brevia vel elongata (1·2^{mm}), limbo incurvo utrinque subduplice, in bracteas ad costam usque fisso, circumdata; bracteæ exteriores 3 vel 4, lato-cuneatæ crenatæ, interiores alternantes breviores subincisæ, supremæ tamen (calyptram stipantes) ad basin usque plurifidæ. Calyptra clavato-cylindrica incurva papillosa, apice alte mammillata.

Amenta ♂ pinnulis inferioribus constantia; alveoli ad 10–12-jugi; limbus incurvus crenato-lobulatus.

5. ANEURA PECTINATA, Spruce.

Hab. per totam sylvam Amazonicam a fluminis ostiis ad Andium Peruviæ radices (alt. 1200^{m}) usque; necnon secus fluvium *Negro* ad ejus origines usque: intra fines Venezuelæ præcipue frequens.

Pinnulæ 1·0–1·5 × ·4–·5; *cellulæ limbi* $\frac{1}{20}$–$\frac{1}{16}$; *calyptra* 3·0 × ·5; *capsula* ·75 × ·35^{mm}.

Pusilla, viridis vel rufescens, cæspitosa. Frondes $\frac{1}{4}$–1 poll. longæ ascendentes, imbricatæ, bipinnatipartitæ. Caulis basi rhizomatosus ramosque breves radicantes edens, ibidem compresso-teres (cellulis 8:8, vel 12:8 in diametris), superne dilatatus et plus minus alatus, ad pinnarum basin cellulis 15 in diametro transverso, 5 vel 6 cellulas crassus (interdum ad 22 × 11 cell. usque), supra pinnas primas paulo angustior sequitur. Pinnæ breves oppositæ confertæ, flabellatim divisæ—quasi bis terve dichotomæ, vel subpinnatæ; pinnulæ laciniæve sub 8, contiguæ, lineares repandæ, costa tenui 4 cellulas, utraque ala 5 cellulas latis. Cellulæ alares majusculæ vix elongatæ pellucidæ; costales interiores superficialibus multo majores, caulis inferioris autem superficiales parum excedentes.

Flores monoici: utriusque sexus pinnulas inferiores abbreviatas sistentes. Pistillidia floris ♀ sub 8-juga, involucro digitatim plurifido utrinque limbata. Calyptra majuscula, superne parum tuberculosa, apice crasse mammillata, medio 6 cellulas crassa. Capsula 4plo brevior, cylindrico-oblonga, rufa, leptodermis; cellulæ elongatæ, linearirectangulares, interiores spira plus minus incompleta farctæ. Elateres helice simplice lata constantes, folliculo cito dissoluto. Sporæ subglobosæ læves elateribus æquilatæ.

Andrœcia linearia, brevia; alveoli sub 8-jugi monandri, involucro angusto incurvo crenulato.

Caulis interdum ipsa basi prostrata tenuior, compressus, ramulosque compressos edens; ubi autem assurgit crassior est, subteres et lignosus.—*Pseudoneura Bogotensis* Gotts. in Hep. Novo-Gran., stirps ut videretur longe robustior, in Andibus alt. circa 2000^{m} viget; nostra autem in ipsa planitie abundat montesque nullibi alte ascendit.

6. ANEURA TRICHOMANOIDES, Spruce.

Hab. Andes Quitenses, in sylva *Canelos*, ad truncos vetustos.

Caulis ·75^{mm} latus; costa ·5 × ·2; pinnæ 3·0^{mm} longæ; pinnulæ 1·0–1·8 × ·5; cellulæ $\frac{1}{8}$–$\frac{1}{20}$^{mm}.

Tenella pallide viridis subprostrata dense stratificata. Frondes 2½–3^{cm} longæ, ambitu lineares, bipinnatipartitæ; caulis alte biconvexus, medio 8 cellulas crassus, sectione lanceolata, late alatus, ala interrupta—quasi in folia bina inter duas pinnas consecutivas divisa—interdum margine muricato-spinulosa. Pinnulæ subcontiguæ lineares lineari-lanceolatæve pellucidæ, costa medio 3–4 cellulas crassa, limbo utrinque costæ subæquilatus, cellulis 7–8-seriatis majusculis oblongo-hexagonis (ad angulum 60°–70° cum costa ordinatis) constante, margine eroso-crenulato superne apiceque serrulato. Pinnæ pinnulæque *oppositæ*, hæ plerumque simplices, raro furcatæ.

Amenta ♂ pinnulâ cujusque pinnæ infimâ superiore abbreviatâ constantia, utrinque limbo incurvo profunde laciniato (laciniis lanceolato-subulatis) involucrata; alveoli sub 6-jugi.

Aneura fucoides Gottsche in Husnot Pl. Antill. no. 205 (1868) duplo major est, minus confertim ramosa, caule omnino exalato, laciniis, apice præcipue, magis argute serrulatis.

7. ANEURA CILIOLATA, Spruce. (Tab. XIX.)

Hab. Andes Quitenses, in monte Mulmúl, ad terram inter muscos sub fruticum umbra.

Caulis 1·5^{mm} *latus*, 0·4^{mm} *crassus*; *pinnæ* 4·0^{mm} *longæ*; *laciniæ* 1·5 × 0·5, *earum limbus* ·1–·125, *cellulæ* $\frac{1}{20}$^{mm}.

Elata, laxe cæspitosa e viridi fulva badiave. Frondes 10–12^{cm} altæ, erectæ, semel bisve dichotomæ, ramis fastigiatis bipinnatis. Caulis dimidio inferiore exalatus, superiore anguste alatus, ala interrupta, velut in folia linearia semilanceolatave ciliata incisa; costa lata subplano-convexa (sectione lanceolatâ 4plo fere longiore quam latâ); cellulæ costæ pluristratæ, stratorum 3 vel 4 externorum pachydermes, rufo-badiæ, internæ pallidæ tenues, triplo longiores quam latæ, subinde, pariete utroque fine dissoluto, in tubulum elongatum confluentes.

Pinnæ dissitæ, oppositæ vel superiores dislocatæ et alternæ, breves, subæquimagnæ pinnatipartitæ, ambitu deltoideæ; pinnulæ sub 3-jugæ subobpositæ, infimæ iterum divisæ; omnes pinnulæ laciniæve latolineares, costa prælata tenuiuscula (medio 6 cellulas crassa), limbo angusto inæquilato pellucido ciliolato, ciliis 1–3 cellulas longis, sursum vel varie directis. Cellulæ limbi majusculæ, oblique directæ (angulo 50°) subelongatæ, rectangulari-hexagonæ rhombeæve, leptodermes, fere vacuæ.

Flores dioici: ♂ amenta pinnulis duabus oppositis (cujusque pinnæ plerumque infimis) constantia; loculi antheridiaque biseriata 3–4-paria; limbus incurvus margine setosus ciliolatusve.

8. ANEURA PALLIDA, Spruce.

Hab. in monte *Chimborazo*, ad arborum ramos.

Pinnæ 6·0 × ·5; *pinnulæ* 2·5 × ·25–·4; *c. limbi* $\frac{1}{30}$; *cal* 3·0 × ·6; *caps* 1·25 × ·5^{mm}.

Elata tenuis pallide viridis cæspitosa. Frondes 6^{cm} longæ, ambitu latolineares, erectæ pendulæve, in planum bipinnatæ; caulis planoconvexus, sectione semilanceolatâ, vel supra leniter convexulâ, medio 8 cellulas crassus, exalatus vel hic illic angustissime alatus; pinnæ subdistantes oppositæ, medio 6 cellulas crassæ; pinnulæ 3-jugæ subopositæ, erecto-patentes, simplices, raro furcatæ, anguste lineares vel lineari-subulatæ, peranguste alatæ, costa 4 cellulas crassa, alis 2–3 cell. latis, 2–1 cell. crassis; cellulæ alares et supracostales mediocres subæquilateræ pellucidæ, costales longiores latioresque subopacæ.

Fl. dioici: ♀ ad spicam brevem (pinnulam pinnarum infimam contractam sistentem) biseriati, involucro angusto in lacinias subulatas filiformesve hamatas utrinque obtecti, pistillidiis ad 12-jugis.

Calyptra pyriformi-clavata, carnosula, tuberculis papillisve perraris conspersa, apice angustiusculo mammillata. Capsula plus duplo brevior elongato-ovalis.

Aneura plumæformis duplo fere elatior, longe robustior, colore fusco, caule subtereti tripinnato, pinnis pinnulisque confertis late alatis diversa est.

9. ANEURA PLUMÆFORMIS, Spruce.

Hab. In monte *Abitagua* terrestris: pl. ♂ sola.

Pinnæ 12–15^{mm} *longæ*; *pinnulæ* 1·0–2·0 × ·65; *c.* $\frac{1}{15}$; *amenta* 2·0^{mm}.

Elata erecta laxe cæspitosa, basi sola radicans, firma, olivacea. Caules 4-pollicares, nigrescentes validi subteretes, inferne simplices bifidive dein plumæformi-tripinnati; pinnæ primariæ oppositæ, inferiores minores dissitæ, mediæ et superiores subæquimagnæ, ambitu ovato-triangulares vel late deltoideæ, planæ convexulæve, pinnas vicinas subimbricantes; pinnulæ lacinulæve omnes subcontiguæ, lineares planiusculæ, costa 5–6 cellulas lata, 3–4c. medio crassa, limbo utrinque 4–6c. lato pellucido; cellulæ limbi subæquilateræ majusculæ ad angulum sub 70° cum costa ordinatæ.

Amenta ♂ pinnulis duabus infimis cujusque pinnæ secundariæ plerumque constantia, cæteris pinnulis angustiora carinata, supra costam profunde alveolata, utrinque limbo suberecto flexuoso-reticulato repando marginata; alveolæ biseriatæ 9–10-jugæ, antheridium singulum foventes.

10. ANEURA ANDINA, Spruce.

Hab. Andes orientales sylvaticos, alt. 300–1500^{m}, vix ad mediam regionem sylvaticam attingens, ad truncos putrescentes haud raro, locis fluv. *Bombonasa*, montibus *Campana*, *Guayrapurina*, &c.

Caulis sectio ·5 × ·3; *pinnæ* 4·0^{mm} *longæ*; *pinnulæ* 1·5–2·5 × ·4–·5; *cellulæ* $\frac{1}{24}$–$\frac{1}{15}$, *c. marginales* $\frac{1}{40}$–$\frac{1}{35}$; *calyptra* 2·5 × ·55, 3·0 × ·6^{mm}.

Cæspitosa virescens, siccando nigrescens. Caules 1–1½ poll. longi, suberecti sæpe decurvi, compresso-teretes (cellulis 12 × 12 in sectione), exalati, basi divisi et rhizomatosi, dein bi-tripinnati; pinnæ oppositæ breves anguste alatæ basi 16 × 8 cellulas in sectione, medio 4–6 cellulas crassæ; pinnulæ omnes lineares retusæ, medio 3–4c. crassæ, costa 4c. lata, ala utrinque 4-5c. lata; cellulæ alarum mediocres suboblongo-hexagonæ subpellucidæ, marginales parvulæ.

Flores dioici: ♀ persæpe binati, oppositi (sc. pinnulis cujusque pinnæ infimis abbreviatis constantes). Involucrum in flore fertili brevissimum, in lacinias paucas subulatas filiformesve fissum.

Calyptra magna, pinnis dimidio longior, cylindrica vel subclavata, albida, papillis breviusculis scabra, inferne 4–5 cell. crassa.
Amenta ♂ binata, opposita, linearia; alveoli 8–20-jugi, ala utrinque incurvulo crenulato obtecti.

Aneura papillata G. duplo major est, calyptra papillis prælongis obsita, &c., altiusque in Andes Granatenses (2100–2700^{m}) ascendit. Anne autem nostra ab *A. bipinnata* Sw. revera diversa?

11. ANEURA HYMENOPHYTOIDES, Spruce.

Hab. in cortice vetusto ad montis *Campana* latera, alt. 1200^{m}.

Frondis laciniæ 2·0 × ·6; *cellulæ* $\frac{1}{20}$–$\frac{1}{40}$; *calyptra* 2·0 × ·45; *capsula* ·9 × ·4; *elateres* ·25^{mm}.

Humilis rufula cæspitosa. Frondes $\frac{1}{2}$–$\frac{3}{4}$ pollicis longæ, basi longe rhizomatosæ tortæ et ramosæ; alii rami breves radicantes, alii assurgentes arcuato-decurvi apice palmatipartiti (revera confertim pinnati, pinnis solum 1–3-jugis, simplicibus vel infimis furcatis); laciniæ omnes solum 4 ad 6, rarissime plures, lato-lineares repandæ, apice rotundatæ emarginatæve, costâ tenui limbo utrinque subæquilato vel paulo angustiore alatâ. Cellulæ rhizomatis compresso-teretis (sectione ellipticâ, cellulis 12 et 8 in diametris) parvulæ subæquilatæ, nisi superficiales subangustiores; laciniarum costales 1–2-(basi 3-) stratæ majusculæ oblongo-hexagonæ sub 6-seriatæ, alares 6-seriatæ vel pauciores, oblique hexagonæ, a costa ad marginem sensim diminutæ, marginales parvulæ: omnes subpellucidæ.
Flores dioici: ♀ in ramis (pinnisve) infimis spicati; spicæ fertiles breves, steriles sæpe elongati multiflori (pistillidiis ad 20-jugis usque, biseriatis brevi-cylindricis opacis). Involucrum limbo utrinque duplice, incurvo, lineari ad costam fere usque in lacinias plurimas subulatas sæpeque hamatas fisso, constans.
Calyptra clavata, haud valde carnosa, ubique papillis brevibus obsessa, apice crasse mammillata. Capsula duplo brevior (exserta haud visa) ovato-cylindrica; cellulæ bistratæ lineares acutæ, pariete laterali columnis brevi-subulatis crebre obsesso. Elateres $\frac{1}{4}^{mm}$ longi, utrinque valde attenuati, helice lata laxe torta, folliculo obsoleto. Sporæ minutæ, helici vix æquilatæ, læves.
Androecia linearia, limbo involucri suberecto crenato, alveolis 6–14-jugis.

A. andina distincta videtur statura duplo majore; fronde bi-tripinnata; florescentiis ♀ haud polygynis, &c. Nostra habitu *Hymenophyti flabellati* &c. insignis.

12. ANEURA LEPIDOMITRA, Spruce.

Hab. Andes Quitenses, in monte Guayrapata, alt. 2800^{m}, ad truncos putrescentes.

Pinnæ 3·0–4·5^{mm} *longæ*; *laciniæ* 1·2–2·5 × ·2; *cellulæ limbi* $\frac{1}{12}$–$\frac{1}{15}$; *calyptra* 3·0 × 1·0^{mm}.

Frondes siccando rufescentes, 3–4^{cm} longæ, erectæ procumbentesve, tenellæ stratificatæ, ambitu lineares vel superne paulo latiores, planæ, bipinnatæ. Caulis, sive costa primaria, ab ipsa basi hic illic

subalata, sectione lanceolata, medio 6–7 cellulas crassa; pinnæ oppositæ, dissitæ vel superiores subimbricatæ, ambitu deltoideo-ovatæ, pinnatipartitæ, laciniis utrinque 3–5, angulo 45° patulis, subcontiguis, linearibus retusis emarginatisve, infimis sæpe bifidis, aliis apice attenuato incurvo gemmiparis, tenuicostatis (costa pinnarum 4–5c. lata, 4–5c. crassa, laciniarum 4c.—apicem versus solum 2c.—lata, 1–3c. crassa), limbo 4–5c. lato, margine late crenato erosove; cellulæ magnæ subæquilateræ subpellucidæ.

Flores dioici: ♀ pinnulis pinnarum superiorum duabus infimis abbreviatis constantis; involucrum sæpius ad squamas 2 digitifidas redactum, raro squamis exterioribus auctum. Calyptra pinnis sterilibus ferme æquilonga, clavata, sat crassa, apice alte mammillata, facie papillis necnon squamulis membranaceis (sæpe bifidis) conspersa.

Obs. In eodem cespite advenit forma luxurians ejusdem (?) speciei, pinnis duplo majoribus flabellato-bipinnatipartitis, sæpius imbricatis, laciniis confertis. Caules validiores, medio 10c. crassi, sectione anguste ovali, inferne rarius subalati. Calyptra paulo minus papillosa.—*A. papillata* G. in Hep. Nov. Gran. differt statura elatiore, pinnulis laticostatis integerrimis; calyptra longissima, papillis prælongis (squamulis nullis) obsita.—*A. andina* S. ab *A. lepidomitra* parum distat, nisi caule ubique exalato et papillis calyptræ nunquam in squamulas foliaceas transmutatis.

13. ANEURA MACROSTACHYA, Spruce.

Hab. in truncis emortuis ad *S. Gabriel del Rio Negro*: planta mascula sola.

Ab *Aneura amazonica*, affini, distat statura plus duplo minore, colore viridi-olivaceo opaco; caule inordinatim bipinnato, flexuoso, ramis sæpe brevibus, limbo vix ullo nisi ad lacinias ultimas; cellulis chlorophyllosis, ad caulis axin 5-stratis, ad lacinias 3–4-stratis, costalibus duplo angustioribus ($\frac{1}{24}^{mm}$) quam *A. amazonicæ*; androeciis sæpe prælongis (alveolis ad 17-jugis) recurvantibus.

14. ANEURA CERVICORNIS, Spruce.

Hab. Andes Quitenses, in monte *Tunguragua*, ad truncos putrescentes; *Pichincha*, ad scopulos humectatos.

Pinnæ ad 1^{cm} *longæ, basi* $\cdot38^{mm}$ *latæ,* $\cdot13^{mm}$ *crassæ; pinnulæ* $\cdot15^{mm}$ latæ; *cellulæ* $\frac{1}{25}$–$\frac{1}{16}$; *calyptra* $3{\cdot}0 \times 0{\cdot}7$; *elateres* $\cdot3$–$\cdot4^{mm}$.

Cæspitosa olivacea rufulave rigidula, facie algoidea. Frondes $1\frac{1}{2}$–4^{cm} longæ, basi decumbentes subdivisæ (vix rhizomatosæ) dein erectæ et laxe- (vel plumiformi-) tripinnatæ, fertiles humiles, steriles elatiores. Caulis exalatus, inferne nigrescens, compressulus vel subteres, sectione oblonga cellulis 7–14 in diametro; cellulæ corticales parvulæ subpellucidæ parum elongatæ; sequuntur strata duo cellularum longiorum discolorum; cellulæ autem axiales pluristratæ majores pellucidæ lineari-elongatæ, pro majore parte prosenchymaticæ. Pinnæ pinnulæque oppositæ vel alternæ plerumque decurvo-secundæ, in sicco sæpe apice circinatæ, anguste lineares biconvexæ; illæ ad costam solam (sectione lanceolata) medio 7–8 cellulas crassam redactæ; hæ (pinnulæ) seusim angustiores et tenuiores, medio 4-cell. crassæ, exalatæ vel superne limbo solum 1–2c. lato alatæ, repandulæ; cellulæ superficiales minores subopacæ, interiores majores longiores et pellucidæ.

Flores dioici: ♀ spicam perbrevem, limbo laciniato utrinque involucratam, pistillidia sub 8-juga foventem, sistentes. Calyptra magna clavata, prope basin 6 cellulas, apicem versus 1–2 cellulas, crassa, tuberculata, desquamans. Capsula multo brevior, subcylindrico-oblonga, endothecii cellulis crebre columniferis. Pedicellus brevis, cellulis 16-seriatis (sc. corticalibus 12-, axialibus 4-seriatis) constans. Elateres prælongi laxe unispiri, utroque fine capillacei. Sporæ minutæ, elateribus vix æquilatæ.

Amenta ♂ pinnulis pinnarum infimis abbreviatis constantia, alveolis biseriatis sub 8-jugis excavata, limbo incurvo acute plurilobulato involucrata.

A. prehensilis Tayl.! (Caput *Horn*, Hook. fil.) statura habituque nostræ similis, diversa est tota fronde anguste alata (nec exalata). pinnis longe brevioribus, laciniis ultimis autem multo latioribus.—*A. alcicornis* Tayl. (ex eodem loco) pinnis pinnulisque prælatis gaudet.

XLI. METZGERIA, Raddi.

in Act. Soc. Sc. Modenæ (1820); Lindberg, 'Monographia *Metzgeriæ*' in Act. Soc. pro F. et F. Fennica (1877).

Plantæ molles, albicantes flavidæve, rarius virides, prostratæ, stratificatæ vel in muscis laxe reptantes. *Frondes* lineares, dichotomæ, rarissime pinnatim divisæ, ramis autem floriferis posticis; radicellas pili-vel ciliiformes, solitarias vel 2–5-nas, subter costam necnon ad margines—interdum e tota facie infera, rarissime etiam e supera—proferentes, vix unquam ubique nudæ. *Costa* bene definita, raro teres, plerumque compressula, sectione ovali, 4–11 cellulas in diametro breviore; cellulæ corticales majores et pellucidæ, interiores angustæ acutæ subopacæ. *Pagina*, s. ala costæ utrinque cellulas 10–25 lata, unistrata, laxe texta, pellucida, sæpe decurva, subinde undulata. *Flores* dioici, rarissime monoici. *Involucra* ♀ (s. bracteæ) ramum posticum abbreviatum, emarginatum obcordatumve, interdum ad annulum calyptræ basin amplectentem redactum, sistentia. *Pistillidia* pauca, 2–5-juga, involucri costulæ distiche insidentia, brevia, astyla, sterilia ad calyptræ basin persistentia. *Perianthium* nullum. *Calyptra* clavata pyriformisve, carnosa, tota superficie, vel saltem dimidio supero, radicellis plus minus pilosa villosave. *Capsula* brevipedicellata, ovalis, ad basin usque quadrivalvis, bistrata; cellulæ exteriores columnis rufis hic illic fulcitæ, interiores fibris annularibus omnino fere carentes. *Elateres* sat longi, utrinque capillacei, helice compressa arcte convoluta impleti, plerique cito decidui; alii autem (*elaterophori*) capsulæ apici adfixi, breves, claviformes, fibras semiannulares includentes, inter se colligati, capsula dehiscente in cohortes 4 divisi, porrecti, cum elateribus nonnullis perfectis intri-

cati in valvularum apice diutius persistentes. *Sporæ* minutæ subtilissimæ. *Involucra* ♂ fœmineis simillima, in formam globosam convoluta; *antheridia* sub 4-juga, globosa, stipite perbrevi cellulam unicam cylindricam sistente suffulta, in involucri costulæ utroque margine inserta. *Propagula* disciformia, unistrata, iis *Lejeuneæ*, *Radulæ*, *Anthocerotis*, &c. simillima, ambitu autem pro more radicellis fimbriata.

Hab. et Distr. Locis umbrosis ad arbores saxaque, in terris temperatis sat frequentes, in calidis et frigidis rariores. In Andibus sylvaticis 8 species legi, quarum una (unica Amazonica!) etiam in planitiem descendit. In insulis Britannicis 4 species, primum a cl. Lindberg in opere supra citato bene definitæ, inveniuntur.

§ 1. *Pinnatæ.*

1. *M. filicina.* Frondes regulariter pinnatæ vel bipinnatæ, pallidæ pellucidæ, costa valida, radicellis marginalibus solitariis alicubi perraris. Calyptra clavata setis (radicellis) longis sparsis armata.

§ 2. *Dichotomæ.*

A. *Radicellæ marginales* 4–5*næ.*

2. *M. polytricha.* Frondes acute dichotomæ tenuicostatæ, tota facie inferiore radicellis hamatis setosæ.

B. *Radicellæ marginales plerumque binæ.*

a. *Pagina inferior tota radicellosa.*

3. *M. bracteata.* Frondes acute dichotomæ, prælatæ, tennicostatæ, undulato-crispæ, subtus radicellis dense villosæ. Calyptra clavato-pyriformis densissime setoso-hirta.
4. *M. fruticola.* Frondes subacute dichotomæ, valide costatæ, utroque margine decurvo, subtus setis longis crebris villosæ.
5. *M. leptomitra.* Frondes angulo recto dichotomæ, margine decurvo radicellis binis brevibus minute ciliato, subtus ad paginam sparse, ad costam densius setulosæ. Calyptra breviuscula, clavato-oblonga, subleptodermis, dense setosa.
6. *M. rufula.* Frondes recte dichotomæ, furcis brevibus, planiusculæ, tenuicostatæ, subtus ad paginam sparse, ad costam densius et longius pilosæ.

b. *Frondes subtus solum ad costam pilosæ, ad paginam calvæ.*

7. *M. leptoneura.* Frondes acute dichotomæ, margine subrevoluto crebre longe ciliato, subtus præter ad costam pertenuem setosam glabræ.
8. *M. claveflora.* Frondes peracute dichotomæ, ad marginem decurvulum et subter costa valida setosæ, cæterum glabræ. Calyptra prælonge clavata, dimidio infero subnuda, supero crebre longisetosa.

1. METZGERIA FILICINA, Mitt. in Pl. Jameson.

Hab. Andes Quitenses, in sylvis humidis, ad arborum et fruticum ramulos, frequens, locis *Azuay*, *Tunguragua*, &c., alt. 2000–3500^{m}.

Frondis lat. 1·12, limbi utr. ·5, costæ ·125; *c* $\frac{1}{25}$; br ·8 × ·5; cal 1·5 × ·75; caps ·75 × ·5; elat ·3–·4mm.

Frondes 2–3-pollicares, pallide flavo-virides, basi tenui in vimine breviter repentes, dein a matrice liberæ, horizontaliter patentes, substratificatæ, ambitu triangulares, pinnatipartitæ, pinnis ad angulum 70°–80° patentibus, interdum apice subhamatis, raro subpinnulatis; costa (ubique alata) valida, sectione elliptica, cellulis majusculis, axialibus pluriseriatis chlorophyllosis, corticalibus fere vacuis cum limbi cellulis continuis et æquimaquis; limbus unistratus pellucidus, uterque cellulis (20 vel paucioribus in latitudine) majusculis subæquilateris convexulis leptodermibus conflatus. *Radicellæ* longiusculæ solitariæ subter costam primariam raro adsunt, pinnarum autem hic illic sat copiosæ, necnon ad frondis margines; sub apice prehensili crebriores.

Flores dioici: ♀ postici, plerumque sub pinnarum axilla, rarius e medio inter duos ramos consecutivos, orti. Bractea reniformi-annularis convolutiva (calyptræ basin demum amplectens) utroque margine ciliata, medio apice nuda. Subinde adjecta est bractea exterior, minor, longe angustior, simili modo ciliata. *Pistillidia* pauca brevia.

Calyptra assurgens anguste pyriformis vel clavata, sparsim longisetosa, valida, basi angusta 8 cellulas, apice 4 cell. crassa, superne papuloso-scaberula vel sublævis, apice demum irregulariter rupta. Capsula in pedicello brevi majuscula, badia, ovalis, ad basin usque in valvulas 4 lanceolatas subinæquilatas patentes fissa. *Elateres* plurimi elongati tenues monospiri, sub valvularum apice inter elaterophoros diu persistentes et in penicillum porrecti. Sporæ parvulæ.

Andrœcia in planta diversa, subter costam hic illic sparsa, solitaria, bina ternave; bractea (sive involucrum) obovato-ligulata (margine sublobata) in globi formam involuta convolutaque, membranacea, tenerrima, tenuicostata. *Antheridia* sub 4 paria, involucri costa utrinque insidentia, globosa, brevissime pedicellata.

Var. *bipinnata*. Elatior, fronde late triangulari arcte bipinnata.—In monte *Tunguragua*.

In hac cæterisque formis frons primum inferne bi-trifida sæpe videtur, divisionibus pinnatim ramosis. Calyptra interdum apice subæqualiter 5-loba.

2. METZGERIA POLYTRICHA, Spruce.

Hab. Andes Peruvianos, in M. *Campana*, ad saxa.

Frondis lat. 2·3; *costa* ·1; *cell* $\frac{1}{20}$; *setæ* ·15–·2mm.

Fulva, dense stratificato-cæspitosa. Frondes $1\frac{1}{2}$-pollicares, parce dichotomæ, angulo acuto (50°), latiusculæ, margine parum decurvo paginaque tota inferiore setoso-pilosæ, setis cellulis 3–4plo longioribus, marginalibus 4–5-nis incurvo-hamatis, cæteris incurvis flexuosisve raro erectis, ad costam densis intricatis, ad paginam sparsioribus; costa angusta, sectione quadrata, supra cellulis 2-seriatis magnis pellucidis operta; paginæ cellulæ majusculæ æquilateræ.

M. myriapoda Lindberg. Monogr. (1877) frondem habet ob alas valde reflexas fere teretem; setas in frondis margine 3–6-nas strictas, in pagina foliacea vix ullas; costam multo validiorem; itaque distinctissima videretur.

3. METZGERIA BRACTEATA, Spruce.

Hab. Tunguragua, ad arborum truncos.

Frondis lat. 3·0; *furcæ long.* 8·0; *c* $\frac{1}{25}$–$\frac{1}{20}$; *setæ* ·15–·25mm.

Pallida, siccando fulva fuscidulave, cæspitoso-stratificata. Frondes $1\frac{1}{2}$-pollicares, intricatæ, acute dichotomæ, costa tenui subterete percurrente, limbo prælato hic illic decurvo-sinuato-constrictove, unde frondes undulato-crispæ evadunt, supra glabræ, subtus tota superficie dense setoso-villosæ, setis paginæ cellulis 4–6plo longioribus, rectis incurvis flexuosisve marginalibus 1–2-(raro 3-)nis; cellulæ majusculæ subæquilateræ subincrassatæ fere vacuæ.

Flores dioici: ♀ crebri. Bractea magna incurvo-concava late oblonga, apice obcordata—haud raro in frondulam dichotome fissam elongata—fere constanter basi utrinque 4–5-lacimiata-lobulatave, extus margineque setosa. Pistillidia brevia, 3-vel 4-paria.

Calyptra clavato-pyriformis, longitudine = caulis lat., densissime setoso-hirta, incrassata, basi 8-cell., medio 4–5c., crassa, demum sæpe infra apicem circumscissa. Cætera haud visa.

Forsan *M. Liebmannianæ* Lind. et G. Syn. Hep. 505, proxima; cl. auctores autem speciem suam describunt subtus setulis brevibus pubescens, (dum in nostra facies postica, setis longis crebris obsessa, potius *villosa* dicenda,) setisque marginalibus solitariis (in nostra plerumque binis).

Obs. The "bract" being cloven at the base, into 4 or 5 rudimentary lobules on each side, is the initial step of the wing (or limb) breaking up into distinct leaves.

4. METZGERIA FRUTICOLA, Spruce.

Hab. Andes Quitenses, in monte *Tunguragua*, ad fruticum ramos.

Fr. lat 2·0; *cell* $\frac{1}{15}$mm.

Viridis, prostrata stratificata intricataque. Frondes 3–4-pollicares iteratim (sub quinquies) dichotomæ angulo subacuto (70°–80°); costa valida subteres, supra cellulis 4-seriatis operta, subtus setis crebris sat longis villosa; limbus utrinque millimetrum latus decurvus, e cellulis sat magnis prominulis subpapulosus, apicibus latiusculis retusis, margine setosus, setis binatis cellulis 2–4plo longioribus.

Flores dioici: ♀ subter costam sparsi; bractea annularis, antice tamen biloba, costata, extus tota setosa.

A. *M. clavæflora* certe diversa fronde magis divisa, costa subtus villosa, cellulis majoribus convexis; bracteis tota facie inferiore setosa.

5. METZGERIA LEPTOMITRA, Spruce.

Hab. In Andibus Peruvianis et Quitensibus, alt. 500–2500m., sc. ad *Tarapoto*, in montibus *Campana*, *Tunguragua*, &c.; necnon in planitie ad fl. *Negro* cataractas; ad arborum ramos, rarius ad saxa.

Fr. lat 1·5–2·0; *cell* $\frac{1}{10}$; *cilia* ·1; *cal* ·8 × ·35mm.

Viridis tenuis tenera prostrata substratificata. Frondes 2-pollicares lineares, iteratim dichotomæ, angulo fere recto, furcis 10mm longis,—aliis autem perbrevibus, aliis subelongatis—latiusculæ, margine decurvo minute setuloso-ciliatæ, ciliis binatis rectis brevibus, raro cellulis paginæ duplo longioribus, subtus tota facie—ad paginam sparse, ad costam densius—setulosæ; cellulæ majusculæ parum elongatæ; costa mediocris compressula supra c. 2 operta.

Flores dioici: ♀ sparsi, sæpe e dichotomiis. Bractea ad squamulam parvam obcordato-reniformem ciliatam extus setosam redacta.

Calyptra breviuscula, frondis dimidiam latitudinem vix superans, clavato-oblonga, tota dense setosa, setis longiusculis, tenuior quam in cæteris congeneribus, basin versus 3 cellulas, superne solum 1–2c. crassa. Capsula globosa.

Plantula sat variabilis, sequentes autem varietates probabiliter melius pro speciebus habenda.

Var. *brevifurca*, pallida fulvave, æqualiter dichotoma, solum 1·1^{mm} lata, subtus præter ad costam perpaulo setosa. Furcæ 3·5^{mm} longæ, valde convexæ, utrinque sensim lateque decurvæ, setis marginalibus 2–3natis, cellulis subminoribus ($\frac{1}{24}^{mm}$). Calyptra longior, 1–5^{mm}, pyriformis.—In M. *Campana*, ad saxa.

Var. *longifurca*, viridis, furcis 10–22^{mm} longis, margine recurvo setis binatis armata, subtus nisi ad costam (fere villosam) subnuda; costa validior subteres intus cellulis perangustis sub 4-stratis conflata. Calyptra 1·3 × ·65^{mm}, obovato-pyriformis.—In M. *Tunguragua* (R. S.), etiam ad fl. *Sabanilla* prope *Loja* (G. E. MASSEE).

Var. *angustifrons*, viridis iteratim dichotoma, angusta (furcis 4–7 × 1·0^{mm}), margine decurvulo setis binatis brevibus (raro solitariis) armata, tota facie inferiore setis sublongioribus—ad paginam plus minus sparse, ad costam dense—pilosula; cellulæ $\frac{1}{30}$–$\frac{1}{24}^{mm}$ subplanæ; costa sat valida, teres, supra cellulis biseriatis velata, subtus alte rotundata, intus cellulis angustis 3-stratis conflata.—*Tarapoto.*

6. METZGERIA RUFULA, Spruce.

Hab. In M. *Tunguragua*, ad ramos.

Frons 1·4–2·0–2·5^{mm} *lata*; *cell.* $\frac{1}{20}$–$\frac{1}{16}^{mm}$.

Pallide rufula stratificata. Frondes 1–2-pollicares æqualiter dichotomæ, furcis sæpe brevibus 2–7^{mm} longis, latiusculæ fere planæ, utrinque parum devexæ, undulatæ, setis marginalibus 1–2-natis cellulis 3–5plo longioribus flexuosis; subtus ad paginam setis sparsis pilosulæ, ad costam densius et longiuscule pilosæ; cellulæ majusculæ parum elongatæ; costa tenuiscula, compresso-teres, utraque facie c. 2–3-seriatis operta.

Flores dioici. Bractea ♀ longiciliata facie nuda.

7. METZGERIA LEPTONEURA, Spruce.

Hab. In M. *Campana* Andium Peruviæ ad saxa.

Fr. lat 1·5; *cell* $\frac{1}{16}$; *cilia* ·3^{mm}.

Fulvo-viridis, prostrata ascendensve, stratificata. Frondes 1-2-pollicares lineares angustiusculæ, iteratim dichotomæ, angulo acuto (40°–60°), furcis mediis 8^{mm} longis, toto margine tam valide recurvo revolutove ut duplo angustiores viderentur, ubique fere æquilatæ, margine crebre longe setoso-ciliatæ, ciliis (=5 cell.) binis divergentibus, subtus præter ad costam setosam glabræ; cellulæ majusculæ æquilateræ leptodermes, fere vacuæ, papuloso-prominulæ; costa supra subtusque 2 cell. lata, tenuis, compressa, axi cellulis solum 2–3-seriatis angustis constante.

Flores dioici: ♀ bractea brevis annularis, v. longior, emarginato-biloba, margine costaque setulosa. Pistillidia 5-juga.

M. hamata Lindberg, huic affinis, distat fronde latiore, et præcipue costa longe validiore cellulis axialibus sub 20-seriatis constante.*

8. METZGERIA CLAVÆFLORA, Spruce.

Hab. In M. *Azuay*, ad arborum ramulos.

Fr. lat 1·6 ; *costa* ·15–·25 ; *cell* $\frac{1}{50}$; *cal* 1·6 × ·125–·15 ; *setæ cal* 1·0 ; *caps* ·7 × ·45^{mm}.

Pallide viridis flaccida pendula. Frondes 3–5-pollicares parce dichotomæ, angulo acuto (45°), furcis elongatis (ad 12^{mm}) angustiusculæ, margine decurvulo costaque subtus setosæ, setis marginalibus binatis mediocribus (cellulis paginæ 4plo longioribus) ; costa lata compressa, supra cellulis corticalibus 4-seriatis operta, sectione ovali (altero diametro duplo majore), cellulis perangustis 5-stratis conflata ; cellulæ paginæ majusculæ subelongatæ leptodermes.

Flores dioici. Bractea ad squamulam annuliformem longiciliatam redacta. Calyptra prælonga (= frondis lat.) clavata, carnosa dimidio inferiore cylindrica stipitiformis subnuda, superiore ovalis setis crebris prælongis, apicalibus erectis, cæteris divergentibus, horrida. Capsula plus duplo brevior ovalis.

Var. *viscida*. In sylva *Canelos*, ad saxa arboresque. Viridissima subviscida, subtus ad paginam hic illic puberula, setis crispulis. Calyptra prælonga, anguste clavata.

Var. *latifrons*. *Canelos*, ad saxa irrigua, locis *Antombos* et ad fl. *Bombonasa*. Frondes duplo fere latiores (2·5–3·0^{mm}), ad margines costamque subtus brevi-setulosæ ; costa etc. qualia in typo.

Var. *latissima*. *Pichincha*, in scopulis humectatis. Frondes ad 4^{mm} latæ anguste dichotomæ, subtus hic illic pilosulæ, margine decurvo setis (cellulis 3–4plo longioribus) binatis ciliatæ ; cellulæ interdum duplo longiores quam latæ ; costa prælata, supra cell. 4–5 velata, sectione anguste ovali, cellulis perangustis pluristratis conflata. (? Anne sp. propria : *M. hygrophila* Spruce.)

Subordo II. MARCHANTIACEÆ.

Vegetatio frondosa, prostrata. *Frondes* cellulis pauci-pluristratis conflatæ, late et indistincte costatæ, supra venoso-areolatæ, areolis pro more medio uniporosis, strato hypoporo cavernoso ; subtus radicellis prælongis fuscis, bifariam patulis, appressis plus minus villosæ, sæpissime etiam paleis (foliolis) coloratis seriatis ornatæ, dichotomæ,

* Species *M. leptoneuræ* proxima est *M. atrichoneura* Spruce, cujus descriptio hic sequitur.

Fr. lat 1·1 ; *cell* $\frac{1}{25}$; *cilia* ·15–·25^{mm}.

Pusilla sordide albicans tenera, laxe alte stratificata. Frondes pollicares, lineares, iteratim dichotomæ (angulo 60°), margine valde recurvo fere revoluto setis binatis (cellulis sub 5plo longioribus) cum contrariis decussatis, ciliato ; cellulæ minusculæ æquilateræ valde papuloso-prominulæ ; costa pertenuis utraque facie cellulis biseriatis operta, *subtus eadem ac pagina omnino nuda*.—Bractea ♀ obcordato-reniformis tenuissima pellucido-reticulata longiciliata faciebus nuda. Pistillidia pauca, 2–3paria, crassa.

Hab. Nova Zelandia, super muscos repens.

raro subsimplices, in aliis speciebus ramulos (frondulas) posticos proferentes. Utplurimum accedunt *ductuli* hydragogi, longissimi, radicellis vix crassiores, pariete nodulis internis hic illic fulcito, fasciculati, in canali longitudinali subter costam inclusi, deinde per pedunculi canaliculos ad capitulum usque protracti; alii autem cum radicellis mixti utrinque e costa patentes. *Flores* dioici, rarius monoici: ♀ e frondis apice vel e facie antica orti, in capituli vel pileoli formam aggregati. *Capitula* plerumque pedunculo valido cum frondis costa continuo suffulta, orbiculata, hemisphærica, vel conoidea, raro integra, plerumque lobata vel profunde radiatim fissa, subtus plerumque paleis angustis barbata, intus locellata, locellis deorsum apertis. *Involucrum* cujusque locelli bivalve, uni-pluriflorum, vel nullum. *Perianthium* deorsum oblique spectans, membranaceum, regulariter fissum, raro nullum. *Pistillidia* 2–12, biseriata. *Calyptra* tenuis, apice fissa, sæpe basi sola persistens. *Capsula* brevi-pedicellata vel subsessilis, globosa, unistrata, circumscissa vel vertice 4–8-fida, raro regulariter 4-valvis. *Elateres* 2–5-spiri, rarissime 1-spiri, decidui. *Sporæ* sæpe majusculæ, subtetraedræ, plerumque asperulæ. *Andræcia* vel peltata pedunculata, vel discoidea sessilia (subimmersa), raro costam marginantia; *antheridia* immersa, in alveolis solitaria, facie capituli frondisve supera poris dehiscentia, ovata vel lageniformia, lactescentia. *Scyphi gemmipari* obconici vel semilunati in aliis generibus adveniunt.

CONSPECTUS GENERUM MARCHANTIACEARUM.

§ 1. *Involucra et perianthia semper præsentia.*

42. MARCHANTIA. Paleæ hypogynæ utrinque 2–5-seriatæ. Pedunculi bi-tri-canaliculati. Capitula pluri-(5–11-)loba, radiata. Involucra 2–5-flora. Perianthia apice 3–5-fida. Capsula stipitata, cellulis annulatis conflata, apice 4–8-laciniata. Andrœcia alte pedunculata.
43. FIMBRIARIA. Paleæ hypogynæ 1–2-seriatæ. Pedunculi 1-canaliculati. Capitula sub 4-loba. Involucra uniflora. Perianthium apice ipso diutius clausum, rimis autem lateralibus sub 8 (4–16) dehiscens. Capsula subsessilis, circumscissa, cellulis exannulatis. Andrœcia sessilia.

§ 2. *Perianthium nullum.*

44. DUMORTIERA. Frons tenuis subeporosa, epaleacea, strato hypoporo nullo. Pedunculi terminales elongati bicanaliculati. Capitula orbiculata 2–8-fida, sæpe setis hirta. Involucra uniflora, apice bilabiata. Calyptra persistens. Capsula stipitata, profunde 4–8-fida. Andrœcia brevipedunculata.
45. AITONIA. Frons carnosula, aliquando postice ramosa, subtus paleacea, strato hypoporo præsente, poris autem minutissimis. Pedunculi frondis facie supera insidentes, solidi. Capitula parvula, ad centrum usque fissa, 1–4-loba. Involucra rima subverticali ab ipsa

basi bivalvia. Calyptra decidua. Capsula subsessilis, circumscissa vel apice dentibus dehiscens, cellulis exannulatis conflata. Androecia immersa.

§ 3. *Involucrum et perianthium omnino nulla.*

46. CLEVEA. Frons tenerrima, distincte reticulata porosaque. Pedunculus solidus. Capsula cellulis fibra spirali vel annulari impletis conflata. Antheridia in costæ marginibus seriata.

XLII. MARCHANTIA, March. fil.

In Mém. Acad. Paris. (1713); Micheli Gen. (1729); Linn. &c.

Frondes carnosæ, raro membranaceæ, semper opacæ, sæpe prælatæ, apice emarginatæ vel dichotomæ, ramis posticis nullis; supra reticulatæ porosæque, strato hypoporo præsente; subtus paleis utrinque 2–5-seriatis radicellisque vestitæ. *Flores* dioici terminales. *Pedunculi* elongati, bi-(rarissime 3-)canaliculati. *Capitula* plus minus convexa, radiatim plurifida, raro subintegra, supra calva, subtus pro more paleis angustis barbata. *Involucra* pluri (2–5-)flora. *Perianthia* apice 3–5-fida. *Capsula* pedicellata, cellulis annulatis conflata, apice 4–8-fida, laciniis plerumque revolutis, vel irregulariter dehiscens. *Elateres* 2–3-(rarissime 1-)spiri. *Sporæ* mediocres—minutæ. *Androecia* peltata, alte pedunculata. *Scyphi* gemmipari obconici, ore plerumque incisi.

Hab. et Distr. Species generis cosmopolitani omnes terrestres, in uliginosis, saxosis præcipue, et carbonariis habitant. In Andium media regione, in terra vulcanica exusta ad fissurarum latera et in paludibus thermalibus, semper fere *Funaria calvescente* consociatæ, valde abundant: paucas species tamen invenire potui. In montium radicibus unica (*M. subandina* n. sp.), in planitie Amazonica nulla, mihi obvia fuit.

1. *M. plicata*? Frondes maximæ subplanæ tenues, supra minute et indistincte reticulatæ porosæque, paleis hypogenis utrinque 4–5-seriatis. Pedunculus bicanaliculatus. Capitulum 9–11-radiatum, radiis linearibus. Involucri sub 5-flori valvulæ margine bis laciniatæ. Perianthia 3-loba. Elateres 2–3-spiri. Capitula ♂ maxima, margine ad ⅓ lobata.
2. M. *polymorpha*. A priore differt fronde humiliore, crasse carnosa, supra distincte reticulata et grandiporosa, subtus paleis paucioribus latioribus stipata; involucris triplo minoribus; capitulis ♂ minoribus sæpe margine subintegris.
3. *M. subandina*. Fr. pusillæ angustæ tenuiculæ iteratim dichotomæ, reticulatæ porosæque, paleis utrinque biseriatis oblique oblongis ex apice lato appendiculatis serrato-denticulatis. Pedunc. tricanaliculatus. Capit. parvulum convexulum profunde 9-radiatum, radiis

lineari-cuneatis emarginatis. Involucrum triflora, marginibus repanda. Perianthium 5-fida. Elateres 1-spiri. Capitulum ♂ ad centrum fere usque sub 6-partita.

4. *M. chenopoda*. Fr. humiliusculæ dichotomæ, insigniter reticulatæ grandiporosæ, paleis utrinque biseriatis cuneato-rotundis appendiculo acuminato spinoso auctis. Pedunculus bicanaliculatus. Capitulum alte convexum integrum vel brevissime 4–5-lobum. Involucrum 2–3-florum, marginibus ciliata. Perianthium 5-fida. Capitulum ♂ 5-partita.

1. MARCHANTIA PLICATA, N. et Mont?

Syn. Hep. 538.—*M. vulcanica* nob. in mst.

Hab. per Andes Quitenses, alt. 1300–3000^{m} frequens, in montibus vulcanicis *Pichincha*, *Tunguragua* et *Carguairazo*, præcipue, ubi ad hiatus terræ profundos, *sanjas* dictos, in latis plagis viget.

Pedunculus 40–60^{mm}; *capituli* ♀ *diam.* 10; *catervula involucrorum* 8 × 5^{mm}, *valvulæ* 6·5 × 3·0; *per* 2·3 × 1·3; *cal* 1·5 × 1·0; *caps* 1·0 × 1·0; *elat* ·5^{mm}.

Frondes maximæ, 10–12^{cm} longæ, 2¼–2½^{cm} latæ, in latas plagas arcte imbricatæ matricique adhærentes, lato-lineares, semel bisve furcatæ (angulo peracuto), apicibus profunde emarginatis, e viridi flavidæ, tenues, teneræ; supra subplanæ, minute indistincte tesselatæ, poris parvis parum distinctis, cellulis bistratis mediocribus (cavernis interpositis vix ullis) ipso margine solum unistratis; subtus radicellis fulvis longissimis e costâ tenuiusculâ oriundis villosæ, necnon paleis albidis quasi-lamellosæ. Paleæ ad lineas e costa utrinque oriundas, sursum arcuatas, subparallelas, sat dissitas autem, seriatim dispositæ, nempe 4 vel 5 ad quemque lineam, imbricatæ, perangustæ, basi longissime decurrentes, apice libero ligulatæ obtusæ.

Flores dioici: ♀ terminales. Pedunculus cum costa continuus, prælongus, bicanaliculatus, tota longitudine ramentis tenuibus subpilosus, vel nudus, basi ipsa tamen bracteis (paleis) paucis orbiculatis reniformibusve tenuibus concavis stipatus. Capitulum symmetricum vel subexcentricum, viride, profunde fissum, radiis 9–11 lineari-teretibus patulis decurvulis. Involucra tot quot radii (lobive), in molem grandem subglobosam conglomerata, bivalvia, multiflora, paleolis paucis pallidis subulatis stipata vel subcalva; valvulæ longe super pedunculum decurrentes, semiovales tenues plicatulæ, hic illic striolis coloratis punctatæ, margine lobulatæ, lobulis profunde laciniatis, laciniis tenuibus incurvis.

Perianthia sub 5 cujusque involucri fertilia, subtransversa, obovato-ovalia 3-loba, lobis brevibus subobtusis, pellucida albida. Calyptra dimidio brevior, ovali-globosa, tenuissima, infra apicem dehiscens. Capsula latitudine calyptræ, globosa viridis fragilis apice irregulariter dehiscens, cellulis unistratis elongatis, fibris annularibus impletis, constans. Elateres prælongi utrinque attenuati bi-trispiri. Sporæ minutæ, elateribus haud latiores, globosæ læves.

Plantæ ♂ cum fœmineis mixtæ. Capitula longipedunculata maxima disciformia, ad ⅓ solum 9–11-lobata, radiis medio turgidis, lobis margine apiceque tenuibus, subplanis decurvulisve. Paleæ hypogenæ ad radiorum costam utrinque 2–4-seriatæ, arcte imbricatæ, ligulato-oblongæ rotundatæ vel eroso-truncatæ, tenuissimæ, sparsim punctatæ, subinde ductulis laxe venosæ. Loculi lageniformes, apice tubulares. Antheridia longe ovata, acuta.

Scyphi obconici alte emersi, margine grosse serrati, extus minute papillosi puberulive; solum in pl. ♂ visi.

Eandem speciem, pedunculo longiore brevioreve ludentem, in plurimis locis Andium Quitensium legi: sc. *Leito*, ditione Ambatensi, in palude, cum fr.; ad cataractæ *Agoyán* rupes, pl. ♂; altera forma in ejusdem fluvii *Pastasa* ripis, brevipedunculata, frondibus subtus insigniter crebriusque lamellosis; altera in rupibus ad *Rio Verde* fl. *Pastasa* affluentem, cum fructu.

Obs. Capilliform dotted ducts (of the same calibre as the radicles, which are not dotted) stretch in fascicles, simulating veins, from the midrib on each side to the margin, parallel to the arcuate rows of lamellæ and usually alternating with them; others not fascicled spread like venules in the interspaces. The frond is spotted beneath with numerous green dots, and from these the ducts seem to originate; as they certainly do in the scales of the male capitula, where they arise from submarginal dots and tend downwards, to the base of the scale.

As I have seen no specimen of *M. plicata*, and only the barren plant is briefly described in 'Synopsis Hepaticarum,' I cannot be sure of its identity with my plant. If, however, it is really the same, then the name is not a happy one, for the fronds are only apparently (not really) plicate beneath, from the rows of paleæ, running obliquely from the midrib on each side to the margin, projecting in ridges when dry. *M. plicata* is said to have the frond "subtus pilosula . . . . margine cartilagineo-denticulata," in neither of which characters does it accord with my plant. M. lamellosa Hp. et G. agrees with it in the 11-radiate calyptra, but differs essentially in the 'fronde crassiuscula canaliculata . . . . squamis marginalibus ovato-rotundis . . . pedunculo nudo."

2. MARCHANTIA POLYMORPHA, Linn. Sp. Pl. II. 1603.

Hab. in palude thermali ad pedem montis *Tunguragua;* etiam per Andes Quitenses in terra volcanica (exusta) præcipue, sæpe *Funaria hygrometrica* consociata, haud infrequens.

Frons ad 10^{mm} *lata; ped* 20; *capit* 10; *involucr* 1·5 × 2·0^{mm}.

Frondes 2–3^{cm} longæ, dichotomæ, lineares vel oblongæ, media costa 16 cellulas, pagina juxta costam 8c., margine 4c. crassæ, supra subelongato-areolatæ, areolis pallide, interstitiis saturate viridibus, poris magnis albido-marginatis; subtus radicellosæ et paleaceæ ad *M. plicatæ* instar, paleis autem paucioribus et latioribus.

Pedunculi paleis filiformibus flexuosis plus minus pilosi. Capitula profunde 10-radiata, radiis decurvis involucra brevia longe transeuntibus. Valvulæ involucrorum latiores quam longæ, margine profunde laciniatæ, laciniis rufis subulato-acuminatis laciniolatis. Pistillidia in involucri fundo conferta, ad rhachin brevem disticha, sub 6 paria, basi brevi globosa, stylo longo tenui terminata, paleolis (bracteis) paucis parvis multipartitis circumdata. Cætera deerant.

Scyphuli medio lobo solitarii, majusculi, infundibulati, limbo lato patulo profunde crenato-serrato, crenulis apiculatis subspinulosis, extus puberuli.

A stirpe vulgari Europæa haud omnino distinguenda.

3. MARCHANTIA SUBANDINA, Spruce.

Hab. In Andium Peruvianorum radicibus, juxta fl. *Huallaga* cataractas, in solo nigro tenaci, ubi sub graminum umbra plagas latas format.

Pedunculus 20–30; *capituli diametros* 3–4; *pedicelli* 1·5; *perianthia* 1·0; *capsulæ* 0·5–0·7; *elateres* 0·5^{mm}.

Pusilla, luride viridis, apice purpurascens, prostrata substratificata. Frondes 4^{cm} longæ, 2–3^{mm} latæ, lineares, subplanæ, iteratim inæqualiter dichotomæ, apicibus subemarginatis, tenuiculæ, supra elongato-areolatæ stomatophoræ, subtus medio pallidæ, margines versus coloratæ. Costa tenuis, subtus canali, fasciculum vasculorum crassum obtegente, percursa. Paleæ hypophyllæ utrinque biseriatæ, roseæ, tenuissimæ, late oblique subfalcato-oblongæ, ex apice rotundato appendiculatæ, margine serrato-denticulatæ.

Flores dioici et monoici: ♀ terminales. Pedunculus elongatus striatus, ramentis paucis angustis, basalibus sublatioribus, obsessus, 3-canaliculatus. Capitulum parvulum subexcentricum, parum convexum, profunde 9-fidum, lobis lineari-cuneatis emarginatis, subtus paleaceum. Paleæ copiosæ roseæ, pedunculi apicem necnon involucra obvelantes, forma variæ, pleræque lanceolato-subulatæ, flexuosæ laciniatæ. Involucra tot quot lobi, cum iisdem alternantia, duplo breviora, tenuia bivalvia, margine repanda, triflora, flore unico (raro altero) fertili. Perianthia late pyriformia tenuissima, apice inæqualiter 5-fida. Calyptra inclusa pyriformis tenuissima, infra apicem rupta. Capsula in pedicello calyptram paulo superante parvula globosa, rufa tenuis, cellulis unistratis intus trabeculatis conflata. Elateres elongati utrinque attenuati monospiri. Sporæ mediocres, tetraedro-globosæ, fulvæ, scaberulæ.

Capitula ♂ fœmineis similia, ad centrum tamen fere usque fissa; lobis paucioribus (sub 6), linearibus crassis, subtus squamis purpureis arcte imbricatis vestitis. Antheridia haud inveni.

M. Berteroana L. et L., et *M. papillata* Raddi, huic subaffines, e descriptionibus distinctissimæ viderentur.—*M. subandina* ex elateribus monospiris inter congeneres singularis.

4. MARCHANTIA CHENOPODA, Linn. Sp. Pl. II., 1603.

Hab. In terra humida umbrosa, ad rivuli ripas præcipue, necnon in rupibus saxisque humectatis, per Andes sylvaticos inferiores, vix supra 2000^{m} ascendens, sat frequens; in planitie calida nullibi visa. Insulis Antillis, necnon in Brasilia centrali australioreque antea inventa fuit.

Frondes 30–40 × 4–5^{mm}; *areolæ* 1^{mm} *longæ; paleæ* 1·3 × 1·1; *br* 2·5 × 2·0; *ped* 20^{mm}.

Sordide viridis, siccando albescens, subtus rubro-purpurea, substratificata. Frondes ter dichotomæ, ligulatæ vel cuneato-ligulatæ, apice emarginato-bifidæ, margine repando-crenulatæ; supra subplanæ, insigniter tesselato-venosæ, areolis suboblongo-5–7-gonis, poris magnis albo-marginatis; medio sat crassæ, pluristratæ (costâ autem vix definitâ), deinde ad margines sensim attenuatæ, cellulis stratorum superiorum densis opacis, strati hypopori cavernis plerumque binatis. Radicellæ pallidæ prælongæ creberrimæ, frondis apices versus autem deficientes.

Paleæ hypophyllæ magnæ 4-seriatæ, bifariæ, roseo-purpureæ, basi lata valde obliqua insertæ, oblique cuneato-rotundæ, elongato-cellulosæ repando-denticulatæ, ex apice lato retuso appendiculam flavam ovato-lingulatam acuminatam spinoso-serrulatam proferentes.

Flores dioici: ♀ terminales. Pedunculus fronde paulo brevior, excentricus, tetragonus, antice subconcavus, ad angulos anticos alte costatus, costis anguste tubulosis, postice convexus profunde bicanaliculatus; pilis sparse villosus, apice squamulis pluribus pendulis, aliis subulatis longe flexuoso-acuminatis, aliis filiformibus, stipatus. Capitula alte convexa, fere hemisphærica, lævia, margine crenulato integra vel brevissime 4-5-loba, cavernosa. Involucra 4v. 5, bracteis duabus receptaculo adnatis, inter se fere liberis, ventricosis, margine conniventibus pulchre ciliato-fimbriatis—ciliis plerisque e cellulis biseriatis formatis, apice bidentulis—tenuibus, elongato-reticulatis, intus sparse papillosis, constantia. Perianthia ovali-globosa, tenuissima, pellucida, albida roseo picta, primum clausa, demum apice inæqualiter 5-loba. Pistillidia 10, vel plura, distiche conferta, 2 vel 3 fertilia. Calyptra oblongo-globosa, pallide virens, validiuscula. Capsula subglobosa, calyptram fere exacte replens.

Capitula ♂ femineis 2–3plo latiora, explanata, stellatim 5-partita, laciniis linearibus supra antheridiiferis subtus paleaceis.

Stirps in Andibus humilioribus late dispersa variat fronde crassiore tenuioreve, semel vel iteratim dichotoma, pedunculo subcentrali vel fere laterali, etc. Ad Baños adest forma capitulo margine omnino elobulato, paleis involucralibus copiosis. In Rio Verde rupibus altera forma major, tenuis, paleis paucis pallidis, valvulis involucri pallidis breviciliolatis.

XLIII. FIMBRIARIA, Nees.

in Hor. phys. Berol. 45, et Hep. Eur. 259; Syn. Hep. 555.

Frondes plerumque carnosæ et opacæ, raro tenuiores et pellucidæ, supra plus minus distincte reticulatæ porosæque, subtus radicellis pilosæ et paleis paucis 1–2-seriatis squamosæ; apice emarginato vel innovantes vel fructiferæ, raro dichotomæ; in aliis speciebus frondulas posticas stipitatas, sæpe floriferas, ♂ vel ♀, proferentes. *Flores* dioici vel monoici. *Pedunculus* in caule, rarius in ramo, terminalis, brevis rarius elongatus, unicanaliculatus, subpilosus, apice paleis angustis pendulis barbatus. *Capitulum* hemisphæricum vel fere planum, margine 4-lobum vel subintegrum. Involucra plerumque 4 (1–6) tenuia brevi-tubulosa, ore lato subbiloba, uniflora. *Perianthium* plus minus emergens, sæpe roseum vel violaceum, ovato-conoideum, apice breviter tubulare, primum integrum, demum rimis 4–16 (raro pluribus) dehiscens, laciniis ipso apice plerumque cohærentibus. *Calyptra* pertenuis et fragilis, in fructu evanescens. *Capsula* brevissime pedicellata, globosa, unistrata, cellulis exannulatis, matura circumscissa. *Elateres* breves 1–3-spiri. *Sporæ* magnæ,

perisporio pellucido elevato-reticulato. *Andræcia* immersa, discoidea, antheridiorum loculis prominulis papillosa, in speciebus monoicis sæpe pone florescentiam ♀ posita, vel ramulis posticis relegata. Apparatus gemmiparus nullus.

Hab. et Distr. Species per orbem terrarum dispersæ, in Europa continentali haud raræ, in insulis Britannicis autem nondum inventæ; semper fere monticolæ, in rupibus humectatis, in rivulorum saxis, raro in ipsa terra vigentes. In Andibus sylvaticis 3 species, quarum 2 videntur novas—in planitie Amazonica nullam—legi.

§ 1. *Frondes subtus purpureæ.*

1. *F. elegans?* Frondes lineari-oblongæ, postice subramosæ, carnosæ, et opacæ, canaliculatæ, supra reticulatæ vel grandiporosæ, paleis hypogenis subulatis acuminatis. Capitula longiuscule pedunculata, hemisphærica, breviter 4-loba, lobis crenatis. Per. emersa 8–10-fida.
2. *F. macropoda.* Frondes ovato-oblongæ, ramis posticis nullis, tenuiculæ, subplanæ, supra indistincte reticulatæ, paleis oblique triangularibus acuminatis. Capitula in pedunculo longissimo convexa, demum plana, ad ½ 4-loba. Per. 12-fida.

§ *Frondes supra subtusque concolores.*

3. *F. Canelensis.* Frondes elongatæ pellucidæ reticulato-venosæ, paleis biseriatis lanceolato-subulatis. Pedunculus brevis. Capitula hemisphærica, ad ½ fere 4-loba. Per. 16-fida.

1. FIMBRIARIA ELEGANS, Spreng.?

Syst. Veg. IV., 235; G. L. et N. Syn. Hep. 561.—*F. Quitensis* nobis in hb.

Hab. Andes Quitenses, in sylva *Canelos*, ad saxa humectata terraque obruta; necnon ad pontem *Baños* (fluvii *Pastasa*) in rupibus trachyticis humidis, cum *Funaria Jamesoni*.

Frondes 0·6^{mm} *medio crassæ; ped* 4·0–8·0 × ·04; *per* 2·0 × 1·1^{mm}.

Frondes sub 2^{cm} longæ, 3–5^{mm} latæ, lineari-oblongæ-obovatæve emarginatæ, canaliculatæ, margine elevato incurvo, sinuato-crenato, crispulo; supra albidæ, tesselatæ, poris magnis perforatæ; subtus nigro-purpureæ, strato corticali valido facile solubili; costa valida immersa, sectione late lanceolata, obtuse carinata, cellulis pluristratis angustis conformibus sectione æquilateris conflata, supra cellulis pluristratis duplo majoribus chlorophyllosis obtecta, subtus radicellas complanatas deferens. Paleæ hypophyllæ paucæ, roseæ, subulatæ acuminatæ flexuosæ. Stratum hypoporum subsuperficiale regulariter cavernosum. Frondes raro sub apice recte innovantes, sæpe medium versus ramulum unum alterumve posticum, quasi-stipitatum, apice obcordato persæpe fructiferum, proferentes.

Flores dioici?—♀ in ramulis, raro in ipsa fronde terminales, paleis paucis purpureis subulatis suffulti. Pedunculus fructûs frondis latitudine duplo fere longior, purpurascens, apice e paleis pendulis albido-roseis, aliis subulatis acuminatis, aliis pluribus subfiliformibus, inferne e pilis patulis, subvillosus, cellulis angustis conflatus, striatus,

hinc anguste canaliculatus, canali filis eadem longitudine, numerosis, tenuibus, exarticulatis, intus hic illic nodosis, repleto. Capitulum hemisphæricum, insigniter bullato-rugosum, breviter 4-lobum, lobis crenato-2–3-lobulatis. Involucra 4, lobis intus adnata, urceolata, membranacea, subbiloba, hiantia. Perianthia longe emersa, ovoideo-conica, plus minus roseo picta, profunde 8–10-fida, laciniis apice—sæpe tota longitudine—cohærentibus, canaliculatis. Capsula . . . .

2. FIMBRIARIA MACROPODA, Spruce.

Hab. Andes Quitenses, in rivuli ripis montis *Pichincha.*

Ped 50 ; *capitula* 5·0; *per* 2·0 × 1·3^{mm}.

Frondes imbricatæ, 2–3^{cm} longæ, 4–6^{mm} latæ, subplanæ, oblongæ vel ovato-oblongæ, rarissime dichotomæ, ramis posticis nullis, sæpe ex apice bifido innovando-continuæ, tenuiculæ, subpellucidæ, margine elevato crenulato crispatulo; supra albidæ, anguste nigro-purpureo limbatæ, indistincte et anguste areolatæ, poris paucis; subtus purpureæ, radicellosæ, parce paleaceæ, paleis subdissitis valde oblique triangularibus acuminatis abrupte acutis purpureis, apice concolori albidove; costa tenuis.

Flores dioici: ♀ terminales. Pedunculus longissimus, frondes duplo excedens, pilis tenuissimis flexuosis parce pilosus, apiceque subbarbatus. Capitula convexa, demum plana, bullata tamen, ad medium 4-loba, lobis cavis (saccatis). Involucra membranâ tenui lobis inclusâ adnatâque constantia, uniflora. Perianthia subemersa capituli marginem haud attingentia, primum oblique pendula, demum horizontalia, ovato-conoidea, ad medium 12-fida, basi albida tenuia; laciniis roseo-purpureis subulatis canaliculatis apice convergenti-connatis. Capsula brevipes, sordide purpurea, tenuis, fragilis, apice circumscissa, inferne irregulariter plurifida. Sporæ magnæ tetraedro-globosæ, sporodermio laxe celluloso pellucido.

Ab affinibus *F. venosa* L. et L., et *F. leptophylla* Mont., distinctissima videretur.

3. FIMBRIARIA CANELENSIS, Spruce.

Hab. Andes Quitenses, in sylva *Canelos*, ad rupes irroratas, aliis hepaticis irrepens.

Frondes 5·0^{mm} *latæ*, 0·3 *crassæ; costa* ·05 *lata;* ped 5·0; *capit* 2·5^{mm} *diametro; per* 2·0; *elat* 0·3; *sporæ* $\frac{1}{15}$–$\frac{1}{12}$^{mm}.

Frondes albescentes, subtus concolores, in sicco pellucidæ, teneræ, subplanæ, prostratæ et stratificatæ, 3–5^{cm} longæ, ligulatæ, hic illic sæpe subconstrictæ, sub apice emarginato haud raro recte innovantes, necnon frondulas posticas, sæpe oppositas, longe stipitatas, obcordato-spatulatas, facie supera receptacula mascula sæpe gerentes, proferentes, subtus radicellis prælongis crebris, e costa distiche patentibus, villosæ, supra e strati hypopori cavernis quasi elongato-reticulatæ, poris tamen paucis inconspicuis. Cellulæ paginæ parvulæ subpellucidæ, 2–4-stratæ, cæteris stratis versus et supra costam adjectis. Costa vera opaca nigrescens, sectione lineari-oblonga, cellulis angustis conflata, subtus paleis dissitis biseriatis suberectis lanceolato-subulatis roseis obsita.

Flores monoici: ♀ terminales. Pedunculus cum costa continuus, brevis

hinc canaliculatus, paleis paucis filiformibus sparsus, basi apiceque paleis sublatioribus involucratus. Capitulum parvulum hemisphæricum, supra bullato-rugosum, intus cavernosum, margine fere ad medium 4-fidum, lobis saccatis, ore rotundatis integris. Involucra membranacea sub-biloba. Perianthia alte exserta, ovato-conoidea, basi pallida tenera, apice ultra medium plurivalvia, valvulis 16 v. 17, violaceis tenuibus firmis. Capsula globosa, supra medium circumscissa, dein irregulariter breviter plurifida. Elateres breves 2-3-spiri. Sporæ magnæ globosæ, perisporio pellucido scrobiculato-reticulato.

Receptaculum ♂ frondulæ posticæ adnatum, ovale, convexum, papillis sub 4-seriatis obsitum, antheridiis jam pridem decisis.

XLIV. DUMORTIERA, Nees.

In Nov. Act. Ac. N. C. VII. (1823); ejusd. Hep. Jav. et in Mart. Fl. Bras. *Hygropyla* Tayl. Linn. Trans. XVII., p. 390, t. 15 (1835).

Frondes dilatatæ, tenues et molles, subdichotomæ vel ex apice emarginato innovando-continuæ, supra venulis tenuissimis anastomosantibus obscure venulosæ, poris autem nullis vel obsoletis, strato hypoporo nullo; subtus epaleaceæ, radicellis prælongis arcte adpressis hirsutæ, ad speciem venosæ. *Flores* terminales, dioici vel monoici.* *Capitula* ♀ pedunculo elongato bicanaliculato, basi paleis indusiato, apice plus minus barbato, cæterum lævi vel setoso, suffulta, orbiculata, convexa vel subplana, 2–8-fida, setis hirta vel calva. *Involucra* tot quot capituli laciniæ, iisdem basi recepta, superne emersa, tubulosa, sæpius setulosa, apice breviter bivalvia, monocarpa. *Perianthium* nullum. *Calyptra* inclusa obovata tenera, apice rumpens, persistens. *Capsula* brevipes subglobosa, profunde 4–8-fida, laciniis demum pro m. revolutis. *Elateres* prælongi, 2–3-spiri, vel ex p. 1-spiri, decidui. *Sporæ* majusculæ globosæ asperulæ. *Andrœcia* brevissime pedunculata, discoidea, subtus convexa, supra plana, locellis internis antheridia ovata apice constricto in papillam prominula includentibus. Apparatus gemmiparus nullus.

Hab. et Distr. Species *Dumortieræ* paucæ bene cognitæ in rupibus humectatis necnon in glareosis humidis montium vigent; per zonas temperatas et calidas rarius dispersæ, in frigidis (quantum scio) nondum inventæ. *D. hirsuta* (Sw.), in montibus sylvaticis Americæ tropicæ valde frequens, etiam in Pyrenæis et in insulis

* "Fructificatio utplurimum dioica, haud raro monoica, aliquando etiam androgyna, quoniam pedunculus idem receptaculo partim antherifero partim capsulifero coronatur. In hoc casu notatu dignum est dum capsulæ vigent antheræ longe antea functæ semper effœtæ." (Tayl. l. c.)

Britannicis inventa est, quoniam *D. irrigua* (Wils.)—forma *D. hirsutæ* europæa, capitulo supra calvo (nec hirsuto)—quoque in Andibus crescit.

1. DUMORTIERA HIRSUTA (Swartz).

Marchantia hirsuta Sw. Prodv. Fl. Ind. occ. 145. *Dumortiera hirsuta* Nees, Hep. Eur. IV., 163. *Hygropyla irrigua* Tayl. de March. in Linn. Trans. XVII., 390, t. 15, f. 1.

Hab. In scopulis saxisque rivulorum et cataractarum humectatis; in Andibus sylvaticis inferioribus magis frequens quam quisqualis *Marchantiacea* et persæpe fertilis: locis *Chimborazo*, *Tunguragua*, *Canelos*, *Campana*, *Tavalosos*, &c.; in planitie solum ad *Yurimaguas* fluvii *Huallaga* et ad fluvii *Negro* cataractas visa.—In totis terris calidis et temperatis inventa est, pro more autem rarius. In Pyrenæis et in Hibernia pulcherrime crescit.

Pedunc. 20–30; *capit* 4–5; *setæ* 1·5–2·0; *cal* 2·3 × 1·8; *elat* 0·9^{mm}.

Frondes læte vel flavo-virides, tenues prostratæ, in plagas latas effusæ, 8–10^{cm} longæ, ad 2^{cm} latæ ubi latiores, lato-ligulatæ, superne dilatatæ, planæ, apice profunde emarginatæ, interdum dichotomæ; supra subtiliter irregulariter reticulato-venosæ; subtus ad costam radicellis prælongis tenuibus bifariam patulis, adpressis venasque simulantibus, hirsutæ; cellulæ majusculæ tenues bistratæ, costam versus 3–4-stratæ, superficiales papilloso-prominulæ (unde frondes in vivo insigniter velutinæ), strato hypoporo proprio nullo, poris nullis vel perraris et minutis; costa purpurascens, biconvexa vel supra fere plana, validiuscula, axi cellulis perangustis pluristratis constante.—Frondes haud raro subter costæ apice iteratim innovantes, innovationibus spathulato-orbiculatis-cuneatisve, basi insigniter abrupteque angustatis.

Flores dioici, raro heteroici. Pedunculus florescentiæ ♀ validiusculus, cum frondis costa continuus, hinc sulcis binis angustis exaratus, basi apiceque paleis angustis lineari-subulatis flexuosis, interdum valde numerosis, rarius perpaucis nullisve, stipatus, cæterum nudus, raro setosus. Capitula orbiculata subconvexa, supra setis conspersa, rarius calva, margine sub 8-loba. Involucra tot quot lobi, monocarpica, pauca fertilia, turgide tubularia, carinata, demum ab apice bilabiatim hiantia, extus longisetosa. Calyptra subæquilonga, obovata, chartacea, apice inæqualiter triloba, persistens. Pedicellus calyptra subbrevior, sat crassus, basi rotundatus.

Capsula semiemersa, globosa, rufo-badia, profunde 8-fida, laciniis revolutis apice plurifidis; substantia tenuis, cellulis fibras annulares includentibus. Elateres prælongi, medio dispiri, utroque fine attenuato autem solum monospiri. Sporæ globosæ, elateribus diametro duplo latiores, tuberculosæ.

Androecia plerumque in distincta planta, brevipedunculata; capitulum disciforme, margine rhizinis ciliatum, intus locellatum (juvenile solum visum, antheridiis nondum formatis).

Var. *irrigua* (Tayl. sp.). Cum stirpe Hibernica ad amussim fere convenit, capitulis supra lævissimis, etc.—In spelunca ad pedem montis *Tunguragua*.

Var. *trichopus* S. Pedunculus tota longitudine setis longis squarrosis conspersus. Capitula supra hirsutissima.—*Chimborazo*, in scopulis rivulorum humectatis.

XLV. AITONIA, Forst.

Char. gen. pl. 147 (1776). *Plagiochasma* Lehm. et Lindenb. in Pug. pl. IV., 13 (1832); Syn. Hep. 511.

Frondes humiles prostratæ, haud crassæ, validæ tamen, plerumque canaliculatæ, ex apice emarginato interdum innovantes, vel subtus paucirameæ; supra exareolatæ, poris nullis vel vix visibilibus notatæ, intus cavernosæ; subtus purpureæ, paleaceæ et radicellis longis cum ductulis punctatis mixtis villosæ. *Flores* dioici vel monoici. *Pedunculi* ♀ antici, pro more breves, striati, solidi, basi apiceque paleis angustis plus minus copiosis stipati. *Capitulum* parvulum, profunde 1–4-lobum. *Involucra* 1–4, capituli lobis adnata, tenuia, rima verticali vel valde obliqua in valvulas duas cochleatas abeuntia, monocarpa. *Perianthium* nullum. *Calyptra* decidua, ipsa basi autem nunc involucro nunc capsulæ adhærens. *Capsula* subsessilis, globosa, cellulis unistratis exannulatis conflata, vel apice dentibus dehiscens vel circumscissa. *Elateres* breviusculi 2–4-spiri. *Sporæ* sat magnæ poly-(sæpe tetra-)edræ, scrobiculatæ. "*Andrœcia* in sinu apicis vel in media fronde immersa, muricato-papillata." (Syn. Hep.).

Hab. et Distr. Species sat numerosæ in die cognitæ locis saxosis rupibusque humectatis, rarius in ipsa terra vigent; terris calidioribus magis frequentes, duæ autem Europam australem habitant, una Novæ-Zelandiæ propria est. In Andibus species 2, ut videtur novas, ipse legi.

1. *A. subplana.* Frons linearis subplana, ramis hypogenis nullis, paleis parvulis uniseriatis. Involucra 1 vel 2, parce paleacea.
2. *A. lanigera.* Frons obovato-oblonga canaliculata, subtus ramosa et radicellis ductulisque dense lanata, paleis hypogenis magnis biseriatis. Involucra 2 vel 3 et pedunculus dense paleacea.

1. AITONIA SUBPLANA, Spruce.

Hab. In rupibus humidis ad *Antombos*, juxta fluvium *Pastasa*, alt. 1800^{m}.

Frondes 15–20 × 4–5; *c* $\frac{1}{1\cdot5}$–$\frac{1}{1\cdot2}$; *paleæ* 1·5 × 1·1; *ped* 10; *invol* 2·0; *paleæ inv. ad* 2·0; *caps* 1·6; *elat* 0·3; *sporæ* $\frac{1}{20}^{mm}$.

Frondes vix pollicares, subimbricatæ, fere planissimæ, raro siccando margine subinvolutæ, lato-lineares, emarginatæ, interdum furcatæ, supra ex albido glaucescentes, exareolatæ, minutissime porosæ, subtus radicellosæ et paleaceæ, in ætate totæ rubescentes; ad axin cellulas sub 6 crassæ, utrinque sensim attenuatæ, ipso margine pagina tenui uni-

strata, cell. 2 v. 3 lata, limbatæ; intus venoso-cavernosæ, cavernis sub 6 cell. latis, 2plo—3plove longioribus. Cellulæ sat magnæ elongatæ leptodermes. Paleæ hypophyllæ uniseriatæ subimbricatæ, roseæ apice albidæ, frondis latitudine multo breviores, basi lata transversa insertæ, oblique triangulari-acuminatæ, repandæ, infra apicem scariosum vel constrictæ vel non.

Flores dioici: ♀ antici, media fronde, vel apicem versus, orti. Pedunculus brevis tenuis, basi nudus, apice paleis paucis pallidis angustis, longe subulatis acuminatis flexuosis barbatus. Involucra vel solitaria unilateralia vel bina opposita, pedunculi apice lata basi affixa, bivalvia, rima obliqua fere verticali. Calyptra inclusa, involucro ex parte adnata, tenuis fragilis, pedetentim disrupta. Capsula paulo minor, subsessilis globosa, operculo margine digitato-fimbriato (laciniis sub 16) circumscissim dehiscens. Sporæ magnæ flavo-fuscæ subtetraedræ, perisporio pellucido cristatim reticulato. Elateres sporis 6plo longiores tetraspiri obtusi.

Pl. Peruvianum Mont. differre videtur fronde canaliculata, subtus solum apicem versus squamosa; pedunculo plus duplo breviore basi paleaceo; capsula apice dentibus dehiscens, nec circumscissa; elateribus solum dispiris.

2. AITONIA LANIGERA, Spruce.

Hab. Andes Quitenses, juxta urbem *Ambato* in declivibus saxosis humidis; necnon in rupibus trachyticis ad pontem *de Baños* dictum supra fluvium *Pastasa*, sociis *Fimbriaria elegante*, etc.

Frondes 16 × 4–7; *paleæ hypogenæ* 2·2 × 2·0, *c. palearum* $\frac{1}{10}$; *perl* 20; *involl* 1·5, *paleæ involl* 4·0 × ·3–·5; *caps* 1·2; *elat* ·25; *sporæ* $\frac{1}{20}$ mm.

Frondes plagas latiusculas sistentes, prostratæ, imbricatæ, anguste obovato-oblongæ, simplices vel furcatæ, ramulos paucos posticos proferentes; supra albescentes exareolatæ, e margine crenulato incurvulo (siccando involuto) subconcavæ; facie inferiore convexulâ nigro-purpureâ ductulis prælongis filiformibus albidis, e tuberculis internis punctulatis, costæ medio tergo ortis, cum radicellis immixtis, dense lanatæ; cellulis paucistratis parvulis æquilateris conflatæ, intus late cavernosæ. Paleæ hypogenæ magnæ roseæ biseriatæ imbricatæ appressæ, oblique triangulares sensim acuminatæ, pulchre reticulatæ, parce perforatæ.

Flores dioici (?): ♀ in media fronde solitarii, vel bini subdissiti. Pedunculus longitudine varia, basi apiceque paleaceus. Capitulum convexum pallidum tenue. Involucra 2 vel 3, oblongo-globosa, rima verticali bivalvia, valvulis tenuibus cochleatis. Paleæ involucrales numerosæ, pendulæ, prælonge subulatæ sensim acuminatæ, basi roseæ, apice scariosæ. Calyptræ tenerrimæ residua in involucri fundo persistentia. Capsula sessilis, involucrum fere replens, globosa, virescens, fragilis, cellulis unistratis inanibus conflata, operculo ad suturam plurifido dehiscens. Elateres breviusculi, sat crassi, obtusi, 4-spiri. Sporæ magnæ flavæ tetraedræ, aciebus compressis crenulatis, perisporio pellucido reticulato-scrobiculato.

XLVI. CLEVEA, Lindberg.

Musci novi Scandinavici in Act. Soc. pro F. et F. Fennica (1868).

Ab *Aitonia* etc. distat fronde tenerrima, supra distincte reticulata;

absentia involucrorum et perianthiorum completa; capsulæ cellulis fibra annulata vel perfecte spirali farctis; antheridiis in costæ marginibus seriatis (nec in receptaculum collectis).

Hab. et Distr. Specierum perpaucarum adhuc cognitarum duas Scandinavicas descripsit cl. Lindberg. Altera species, Andina, sine dubio Europæis congener, infra descripta erit. Omnes ad terram in rupium fissuris crescunt.

1. CLEVEA ANDINA, Spruce.

Hab. Andes Quitenses, in terra rupium umbrosa humida juxta pontem fluvii *Pastasa* "*de Baños*" dictum, etiam loco simili prope *Ambato*, alt. 2000–2800^{m}, rarissime.

Frondes 6–10 × 6^{mm}; *squamæ* 1·5; *ped* 1·5–3·0; *recept* 2·0; *caps* 1·25: *elat* ·25; *sporæ* $\frac{1}{20}^{mm}$.

Frondes prostratæ subimbricatæ tenerrimæ pellucidæ, cuneato-subrotundæ, emarginatæ furcatæve, margine crenulato siccando lenissime incurvulo, pallidæ purpurascentesve, pulchre viridi-reticulatæ, areolis elongatis, poris obscuris, subtus squamosæ et parce radicellosæ, medio sub 6 cellulas crassæ, intus cavernosæ. Squamæ sparsæ, paucæ margini proximæ, ad axin plures et magis confertæ, ex albido roseæ, anguste oblique triangulares, acuminatæ. Cellulæ frondis parvulæ leptodermes pellucidæ.

Flores dioici (?): ♀ e frondis media facie superiore orti. Pedunculus perbrevis lævis nudus. Receptacula epaleacea biloba; lobis subglobosis dimidio supero carnosis cavernosis papulosis, inferne sensim attenuatis, ipso margine submembranaceis, fructum unicum includentibus. Involucrum et perianthium omnino nulla. Calyptra subglobosa tenuissima, basi ipsa tamen in collum cupuliforme constricta et subincrassata, demum irregulariter bivalvis. Pedicellus brevissime cylindricus, basi in calceolum obconicum dilatatus. Capsula globosa viridi-badia fragilis, inæqualiter 7–8-fida, cellulis unistratis elongatis fibra spirali perfecta repletis conflata. Elateres mediocres trispiri, fibra tenui, folliculo sæpe dissoluto.

Cl. hyalina Lindberg, differt fronde angustiore, paleis serratis; pedunculo apice paleaceo, capsula subsessili, 3–5-valvi, cellulis fibra annulata farctis conflata.

Subordo III. RICCIACEÆ.

"*Vegetatio* frondosa cellulosa crassiuscula, epidermide distincta stratoque cavitatum aërearum epidermidi in quibusdam subjecto prædita. *Fructus* evalvis, frondi vel impositus pedicellatus sessilisve, vel immersus. *Involucrum* commune nullum; proprium aliis utriculiforme apice perforatum, aliis nullum. *Perianthium* nullum. *Calyptra* stylo evanescente coronata. *Capsula* vel libera vel calyptræ connata, globosa, irregulariter rumpens. *Elateres* nulli. *Sporæ* angulosæ. *Antheridia* frondi immersa, orificio excretorio in

frondis superficie papilliformi aut conico-subulato." (G. L. et N. Syn. Hep. 592.)*

XLVII. RICCIA, Mich. Nov. Gen.

"*Frondes* repentes, primitus radiatim e centro divisa, laciniis dichotomis, in dorso [supra] planis depressis aut canaliculatis, in ventre [subtus] convexis nudis squamatisve, epidermide distincte eporosa, strato cavitatum aërearum in aliis obvio aliis deficiente. *Fructus* frondi immersi, nec nisi rupta superficie (superiori inferiorive) denudati, sessiles. *Involucra* nulla. *Calyptra* cum capsula tenui cohærens, stylo diu persistente acuto prominulo coronata. *Capsula* intra calyptram sessilis." (Syn. Hep. 598.)

1. *R. lanigera.* Frons tenuicula intus vix cavernosa, subtus lanata, orbiculata, ad centrum usque partita, iteratim dichotoma, laciniis angustis subcanaliculatis. Capsulæ solitariæ. Sporæ magnæ elevato-reticulatæ.
2. *R. amazonica.* Frons crystallina cavernosa, tenuicula tamen, paulo radicellosa, bis dichotoma, laciniis latis retusis. Capsulæ 2–5-næ. Sporæ minores muriculatæ.
3. *R. crassifrons.* Frons carnosissima, cavernosa, supra ad speciem reticulato-venosa, ad centrum fere usque fissa, iteratim dichotoma, laciniis late linearibus retusis medio 10 cellulas crassis, parum radicelliferis. Capsulæ 1–2-næ. Sporæ magnæ minute reticulato-scaberulæ.

1. Riccia lanigera, Spruce.

Hab. in fluvii *Ramos*, flum. Amazonum tributarii, ripis limosis.

Frondis radius 10·0; *ramuli* 1·5 × 0·7; *cellulæ* $\frac{1}{10}$; *capsulæ* ·35–·4; *sporæ* $\frac{1}{24}$–$\frac{1}{20}$ mm.

Frons pallide viridis, sicca immutata, orbicularis, diametro 2cm, ad basin usque partita, ter quaterve dichotoma, furcis angustis linearibus subcanaliculatis, medio cellulas 2 vel 3 crassa, marginibus tenuis, intus vix cavernosa, subtus radicellis lanata; cellulæ magnæ leptodermes pellucidæ.

* I have so few species of this suborder to describe, and I have had so little occasion to study those of other countries—notably southern Europe and western Australia, where they grow far more abundantly than on the Amazon—that I quote from the 'Synopsis Hepaticarum' almost literally the characters of the suborder and of the solitary genus (*Riccia*) of which I gathered any specimens. The definition of the suborder might require a little modification to exclude *Sphærocarpus* Mich., probably also *Corsinia* Raddi. and *Tesselina* Dum.

All the South-American species I found belong to the subgenus *Ricciella*, having the capsules immersed near the *under* surface of the frond. Of a few additional species, gathered on muddy shores of the Amazon and its tributaries, the specimens are missing, having probably been thrown away when the parcels were first opened, as mere lumps of dried earth, which they doubtless much resemble.

Flores ♀ numerosi, juxta laciniarum axin subtus alte protuberantes, strato cellularum tenui obtecti, solitarii. Capsula magna globosa tenuissima. Sporæ magnæ angulari-globosæ, epidermide pulchre reticulata, reti alte prominulo (unde sporæ scabræ evadunt) aciebus truncatis retusisve.

2. Riccia amazonica, Spruce.

Hab. in fluminis Amazonum ripis limosis juxta *Obidos*, ubi cum filicis prothallio mixta provenit, etiam ad ejus tributarium *Paraná-miri dos Ramos* dictum. In Andium radicibus orientalibus ad fl. *Huallaga* ripas, necnon prope vicum *Tarapoto*.

Frons 6·0; *cellulæ* $\frac{1}{10}$; *capsulæ* ·38 × ·25; *sporæ* $\frac{1}{35}$—$\frac{1}{32}$ mm.

Frondes crystallinæ, cavernosæ, orbiculares vel late cuneatæ, bis dichotomæ, segmentis latis retusis, subtus radicellosæ; cellulæ magnæ pellucidæ, margine frondis tenui unistratæ, cæterum tristratæ, cavernis maximis interpositis.

Flores dioici (?): ♀ in alveolis 1–5-ni, in frondis facie inferiore prominuli. Capsulæ ovali-rotundæ, tenerrimæ. Sporæ majusculæ, angulato-globosæ, scaberrimæ (minute muricatæ papillosæve).

Altera forma adest, fronde latiore, laciniis semel furcatis prælatis, apice breviter bilobis sæpeve 4-crenatis, fructibus magnis numerosis; conspecifica autem videretur.

3. Riccia crassifrons, Spruce.

Hab. ad terram insulæ fluvii *Negro* inundatæ, paulo supra ejus ostia, socio *Ephemero æquinoctiali* Spruce.

Frondes 10·0–8·0 × 1·5–1·2–0·6 mm; *cellulæ* $\frac{1}{10}$; *capsulæ* ·3 × 35; *sporæ* $\frac{1}{20}$ mm.

Frondes pallide virides, in orbem expansæ (radio 8–10 mm) ab ipso fere centro fissæ, ter quaterve dichotomæ, laciniis late linearibus retusotruncatis, valde carnosæ, medio 10 cellulas crassæ, e cavernarum subsuperficialium interstitiis ad speciem venosæ, angulo venarum peracuto, supra bullatæ vix concavæ, subtus alte convexæ radicellisque paucis conspersæ.

Fructus subter fronde alte prominuli, nigrescentes. Capsulæ solitariæ, magnæ—vel binatæ, parvulæ. Sporæ magnæ polyhædræ; epidermide tenui, vix subpellucida, minute reticulata, parum scaberula.

R. lanata S. distincta est frondibus angustioribus, triplo tenuioribus, vix cavernosis subtus radicelloso-lanatis; sporis insigniter cristato-reticulatis.

Subordo IV. ANTHOCEROTACEÆ.

Vegetatio frondosa, mollis, sæpius laxe texta. *Frondes* plerumque orbiculares, margine plus minus profunde lobatæ incisæve, costâ prælata cum pagina utrinque confluente et confusâ; in aliis paucis autem pinnatim fissæ, costa angustiore et bene definita, pagina utrinque lineari unistrata; in omnibus subtus ad lineam mediam radicellosæ, supra eporosæ interdum autem e cellulis gonidiiferis

opacis punctatæ. *Paleæ* hypophyllæ nullæ. *Flores* monoici vel dioici, antici; ♀ media fronde costave insidentes. *Involucrum* assurgens erectumve, corniforme tubulosum carnosum, ore scarioso oblique truncato vel labiato. *Perianthium* nullum. *Calyptra* nulla. *Archegonium* oogonio solitario nudo intra frondis (costæ) substantiam nidulante constans. *Fructus* pedunculatus capsularis (siliquiformis) lineari-cylindricus vel anguste tetragono-prismaticus, raro fusiformis, bivalvis vel, sutura altera haud soluta, ad speciem univalvis, columellâ (sive dissepimento) axiali filiformi percursus. *Elateres* fibra simplice lata, vel perfecte spirali vel solum undulata et flexuosa, vel etiam geniculata et pedetentim rumpente, impleti. *Sporæ* primum in utriculis tetrasporis inclusæ, demum liberatæ, tetraëdræ, sat magnæ (diametro $\frac{1}{45}$–$\frac{1}{25}$ mm) facie externa convexa (saltem) muriculatæ. *Antheridia* in alveolis—raro biseriatis, plerumque in frondis facie supera inordinatim sparsis—immersa, primum strato superficiali operta, serius detecta, solitaria vel sat numerosa.*

Obs. The chlorophyllose bodies—supposed analogues of the *gonidia* of lichens, and sometimes called by the same name—found in most species of Anthoceroteæ, especially in the cells of the uppermost stratum of the frond, Leitgeb thinks he has proved to be colonies of *Nostoc*. That they are aliens, or parasites, seems proved by their abundance in some species of *Anthoceros*, and their almost total absence in others. In *Dendroceros* I have noticed none in the substance of the frond; but the middle stratum of the three concentric strata composing the peduncle consists of cells containing a dark-green chlorophyl which is probably gonidioid; and underneath the costa of the frond I find naked blackish tubercles, evidently parasitic, and possibly referable to some species of *Nostoc*.

The inordinately large cells found in the leaves of certain *Lejeuneæ* and *Frullaniæ*, either grouped in *ocelli* or (as in *Frullania Tamarisci*) arranged in moniliated lines, probably owe their existence to the presence of a parasite. They are at first filled with an opaque grumous matter, usually of a green colour, but changing to brownish or reddish, and finally exuded, yet clinging awhile to the under surface of the cell, which itself remains empty and pellucid. The curious circumstance is that although these *eye-cells* are caused (as I suppose) by the intrusion of an alien, they should exist only in certain species, while in others of the same genus they are uniformly absent; so that the ocelliferous tendency is developed only along certain lines, along with other characters deemed of specific value. *Fr. Tamarisci*, which has the eye-cells arranged in a single moniliform row, simulating a nerve, and the allied *Fr. germana*, where there are no eye-cells at all, afford a striking and easily-accessible illustration.

CONSPECTUS GENERUM.

48. DENDROCEROS. Frons pinnatifida vel bipinnatifida, costa angusta

* In *Anthocerotis* specie monoica, nondum bene determinata, ab amico STABLER juxta *Levens* Westmorlandiæ lecta, antheridia valde numerosa, 18–29 in quoque alveolo, invenimus.

bene definita, paginæ cellulis unistratis ad angulos insigniter incrassatis, gonidiis nullis. Capsula exserta. Elateres perfecte spirales.

49. ANTHOCEROS. Frons orbicularis lobata laciniatave ad speciem ecostata, cellulis plerisque gonidiiferis. Capsula exserta. Elateres raro spirales, pro m. solum flexuosi.

50. NOTOTHYLAS. A priore differt capsula subsessili apice solo emersa, elateribus geniculatis frustulatim disruptis.

XLVIII. DENDROCEROS, Nees.

Syn. Hep. 579. *Anthocerotis* sp. Raddi. *Monoclea* Hook. ex p.

Frondes late lineares, pinnatim ramosæ, insigniter crispatæ: pagina tenuis unistrata, interdum in lacinias latas, folia simulantes, fissa, incrassationibus tetragonis ad cellularum angulos, gonidiis nullis; costa perfecte definita, angusta, pluristrata. *Flores* monoici: ♀ sicut in subordinis caractere supradescripti. *Capsula* pedunculata, involucro exserta. *Elateres* monospiri, perfecte helicoidei. *Antheridia* in costa biseriata.

Hab. et Distr. Species paucæ huic generi recte adscriptæ in arborum cortice imo in foliis vivis vigent, extra zonam torridam forsan nullibi visæ.

1. *D. crispatus.* Frons semel bisve pinnatifida, laciniis linearibus sinuato-crispis integris, anguste costatis. Capsula linearis, involucro paulo longior.
2. *D. foliatus.* A priore differt fronde plus duplo latiore, minus ramosa, late sed distincte costata, pagina utrinque in lacinias (folia simulantes) latas crispatissimas ad costam fere usque fissa; capsula duplo longiore lineari-subulata.

1. DENDROCEROS CRISPATUS (Hook.?) Nees.

Monoclea crispata Hook. Bot. Misc. I, 117, t. 27?

Hab. In Andium Peruviæ radicibus ad fluvii *Huallaga* ripas, juxta *Yurimaguas* et *Tarapoto*, arboricola.

Frondis lat. 1·2; *costæ sectio* 0·3 × 0·1; *c* $\frac{1}{35}$–$\frac{1}{30}$; *involl* 6·0 × 0·4; *ped* 6·0; *caps. valv.* 8·0 × 0·3; *elat.* 4; *sporæ* $\frac{1}{25}$ mm.

Amœne viridis, cæspitoso-procumbens. Frondes 2cm longæ, assurgentes, bipinnatifidæ, laciniis brevibus lato-linearibus contiguis vel subimbricatis, insigniter sinuato-crispis, valide anguste costatis, apice (sæpe furcato) truncato-rotundatis; costa sectione semilanceolata oblongave medio 8 cellulas crassa subtus parce radicellosa, ad ramorum insertionem geniculato-subflexuosa; cellulæ paginæ unistratæ mediocres quadrato-hexagonæ, ad angulos incrassationibus tetragonis fulcitæ, intus flexuosæ, endochronio copioso.

Flores monoici: ♀ antici, e costa versus ramorum furcas oriundi. Involucra primum brevia, apice tenui, fundo oögonium solitarium obclavatum foventia, matura lineari-corniformia erecto-incurva, ore

hinc in labium linguæforme protracta, papillosa, carnosa 6-strata. Pedunculus brevis, semper fere immersus, basi intra involucellum oblongum carnosum receptus, pallidus, cellulis tristratis (6 in diametro), intermediis chlorophyllosis (corpusculo opaco farctis) conflatus. Capsula semiemersa, involucro longior, lineari-cylindrica, rufa, bivalvis; columella filiformis persistens. Elateres mediocres obtusi, fibra spirali prælata impleti. Sporæ majusculæ asperulæ. Antheridia in costæ utroque margine uniseriata, sæpe florem ♀ approximata, solitaria, subglobosa, brevistipitata, singula e mammillâ altâ apice demum ruptâ, emergentia. [Adsunt etiam, subter frondem ad costam sparsa, corpuscula nigra globosa cellulosa, materie grumosa repleta: anne *Nostocis* species?].

Var. *simplicior*, fronde semel pinnatifida, aliis ramis interdum furcatis.—*Pará*, in palmarum arborumque truncis; *Chimborazo*, in folio vivo (alt. 1200m).

2. DENDROCEROS FOLIATUS, Spruce.

Hab. Ad arbores in sylva *Canelos*, loco *Cuesta de Mapoto*, prope fluvium *Pastasa*.

Frons 5mm *lata*; *costæ sectio* 1·0–1·2 × 0·2; *c. paginæ* $\frac{1}{40}$–$\frac{1}{30}$; *invol* 8·0 × 0·6; *caps* 15·0 × 0·45; *elat* ·3–·4; *sporæ* $\frac{1}{25}$mm.

Robusta cæspitosa viridis. Frondes 2cm longæ, basi palmatim divisæ dein pinnatifidæ, laciniis brevibus prælatis simplicibus furcatisve; costa valida, lata, plano-convexa, medio 8 cellulas crassa, basin versus parce radicellifera; pagina utrinque 2mm lata, in "folia" subæquimagna late reniformia sinuato-lobulata insigniter replicato-crispa profunde (raro ad costam usque) fissa; cellulæ mediocres parvulæve, plerumque quadratæ, interstitiis incrassatis tetragonis ad angulos fulcitæ.

Flores monoici: ♀ antici, infra costæ apicem orti. Involucrum cylindricum, viscidum subpapillosum, medio 3 vel 4 cellulas crassum, apice hinc in labium rectum protractum. Pedunculus paulo brevior, basi bulbosus. Capsula maxima, involucro duplo longior, basi sola immersa, cylindrico-subulata, rufa, bivalvis vel uno solo latere dehiscens. Elateres pallidi debiles, helice lata apice subevoluta farcti. Sporæ sat magnæ scaberulæ.

Antheridia ad laciniarum costam subbiseriata, solitaria maxima stipitata, raro 2–3na et minora.

Var. *megalospora*: fronde crispatissima, costa prælata rufescente, sporis maximis ($\frac{1}{12}$–$\frac{1}{15}$mm) sublævissimis; elateribus fragilibus minus perfecte spiralibus.—*Antombos*, in ripis ejusdem fluvii *Pastasa*.

Obs. Dendroceros foliatus, with the frond cloven almost down to the midrib into broad imbricated laciniæ, resembling separate leaves, is the analogue of *Symphyogyna Brongniartii* var. *pinnatipartita*, of *Aneura trichomanoides*, and of *Metzgeria* bracteata.—These species, and a few others, may almost claim the possession of distinct leaves, and, placed by the side of a *Jungermania* with longitudinally-inserted leaves, such as *Cephalozia* (*Alobiella*) *integrifolia*, show how easy is the transition from a frondose to a foliose stem.

XLIX. ANTHOCEROS, Mich. Gen. (1729).

Frondes plerumque orbiculares, radiatim lobatæ, planiusculæ vel in centro depressæ; costa prælata cum pagina utrinque confluente et

confusa ; cellulæ leptodermes, pleræque gonidiiferæ. *Flores* monoici vel dioici. *Capsula* pedunculata exserta. *Elateres* in paucis perfecte spirales, in plerisque solum undulato-sinuati. *Antheridia* supra frondem sine ordine sparsa.

Hab. et Distr. In terra nuda humidiuscula, in rivulorum saxis arenaque, etiam in truncis semiputridis. Regiones temperatas, rarius calidas, totius orbis terrarum habitant. In planitie Amazonica nullam inveni, in Andibus autem, alt. 500–3500^{m}, 5 species haud raro vigebant. Species Europææ, Britannicæ præcipue, investigatione accuratiore carent.

§ 1. *Elaterum fibra perfecte spiralis. Involucra elongata* (7^{mm} *longa*).

1. *A. flavens.* Monoica, fronde impunctata subcarnosa, medio 6–8c. crassa. Elateres breviusculi.
2. *A. callistictus.* Dioica, fronde insigniter viridi-punctata membranacea, medio 3–4c. crassa. Elateres longiores.

§ 2. *Elaterum fibra solum undulata flexuosave, interdum geniculata et fragillima. Involucra breviora* (1–5^{mm} *longa*).

3. *A. squamuligerus.* Dioica, fronde subplana avenia, facie supera squamulis foliaceis polymorphis obsita. Involucra longiuscula carnosissima. Sporæ majusculæ sublævissimæ.
4. *A. venosus.* Monoica, fronde sulcato-venosa, supra nuda. Involucra brevia. Sporæ parvulæ subasperulæ.
5. *A. Pichinchensis.* Dioica, fronde avenia nuda, profunde pinnatifido-lobata. Elateres geniculati valde rudimentarii. Sporæ minutæ asperulæ.

1. ANTHOCEROS FLAVENS, Spruce.

Hab. super muscos in truncis putridis ad montem *Pingullu*, prope pagum *Tavalosos* Andium Peruvianorum.

Frondes 10–20 × 10; *cellulæ* $\frac{1}{20}$; *involl* 7 × 1; *caps* 40–42^{mm} *longæ*; *elat* ·25; *sporæ* $\frac{1}{40}$^{mm}.

Frondes flavescentes, siccando vix mutatæ, læves, aveniæ et *impunctatæ*, imbricatæ, cuneato-rotundæ-oblongæve, breviuscule lobatæ, lobis rotundatis crenato-lobulatis, carnosulæ, medio 6–8 cellulas crassæ, utrinque ad margines usque sensim sensimque attenuatæ, cellulis majusculis pellucidis, omnibus subconformibus, *nullis nucleatis*.

Flores monoici : ♀ antici, e medio lobo orti. Involucra depressa, parum assurgentia, longiuscula, subulata, truncata, carnosa, basi ipsa minute papillosa cæterum lævia. Capsula in pedunculo parum exserto longissima, 4^{cm} et ultra longa, tenuis bivalvis. Elateres perfecte spirales, helice lata pallida laxe contorta. Sporæ parvulæ subglobosæ compressulæ minute muriculatæ.

Alveoli masculi frondis margines versus sparsi, 1- (raro 2-) andri.

Pulchra et distinctissima species, cum *A. lævi* fronde impunctata conveniens, diversa autem involucro elongato et elateribus perfecte spiralibus.

A. callistictus noster, huic subaffinis, frondes habet tenuiores, crassi-

tudine ubique fere æquali, strato superficiali viridi-punctato, margine valde diverso quasi sinuato-denticulato-lacerove; capsulas subbreviores; elateres majores; sporas tamen subminores.

Ad oppidum *Lamas*, a monte supracitato haud remotum, in rivuli arena advenit var. *brachycarpa* ejusdem *A. flaventis*, colore magis sordido, capsula quadruplo breviore (10^{mm} longa); cæteris caracteribus autem cum typo bene conveniens.

2. ANTHOCEROS CALLISTICTUS, Spruce.

Hab. In liquis fl. *Bombonasa* irrigatis, supra muscos repens.

Fr 20 × 5–8; *inv.* 7·0 × ·5; *ped* 10; *caps* 30; *elat* ·3–·4; *sporæ* $\frac{1}{45}$^{mm}.

Frondes subplanæ læves, virescentes, punctis intense viridibus conspersæ, suboblongæ, inæqualiter lobatæ denticulato-sinuatæque, enerves tenuiusculæ, ubique fere æquicrassæ, margine vix attenuatæ, cellulis 3–4-stratis, superficialibus minoribus firmioribus viridibus, cæteris multo laxioribus pellucidis fere vacuis, subtus parum radicellosæ.

Flores dioici: ♀ versus loborum apices orti. Involucra subelongata subulato-cylindrica curvula. Capsula in pedunculo subexserto longissima involucrum sæpe 4plo superans uni- (raro bi-) valvis. Columella valida. Elateres elongati, spirâ unicâ prælatâ tenui (perfectâ tamen) constantes. Sporæ parvæ subglobosæ muriculatæ.

3. ANTHOCEROS SQUAMULIGERUS, Spruce.

Hab. In monte *Pichincha*, ad rivulorum saxa, aliis hepaticis immixta.

Frons 25 × 12^{mm}; *squamæ* 0·8–1·0^{mm} *longæ; invol* 5·0 × 1·7; *ped* 25; *caps* 30 × 0·5; *elat* 0·2; *sporæ* $\frac{1}{25}$^{mm}.

Frons prostrata viridis, longe obovato-oblonga, crenato-lobulata, carnosa, medio 6–8 cellulas crassa, utrinque sensim attenuata, subtus medio valde radicellifera, supra (medium versus præcipue) insigniter squamuligera, squamulis vix millimetrum longis, forma variis, linearibus, subulatis, raro latioribus et subtriangularibus, integris vel varie paucilaciniatis, haud raro 2, 3 vel 4 in unam latam basi connatis, medio 4–6 cellulas crassis, sursum inflexis; cellulæ frondis omnes subconformes, parvulæ leptodermes, pleræque nucleo nigrescente lineari rotundove farctæ.

Flores dioici: in fronde apicem versus insidentes. Involucrum breve, validum, clavato-cylindricum, subpapillosum, inferne 10-12 cellulas, apicem versus 5-8 cell. crassum. Pedicellus involucro 5plo longior, validus, intus cavus (sporis elateribusque rudimentariis repletus). Capsula involucro 6plo longior, linearis, tetragono-prismatica, minute papulosa; angulis unisulcis quatuor (nempe 2 ad suturas laterales, 2 utrinque in valvularum media facie) incrassatis, cellulis rigidis opacis bistratis, strato medullari (*?*) tenui interposito, conflatis. Elateres breves incompleti, fibra plana tortave subflexuosa haud helicoidea. Sporæ majusculæ angulari-rotundæ, perispermo pellucido sublævissimo.

Fronde squamuligera, involucro carnosissimo, pedunculo longissimo, necnon capsulæ structura peculiari inter congeneres insignis.—*A. adscendens* L. et Ldng., in Australia lecta, fronde squamulosa nostræ similis, involucra habet brevissima (millimetrum longitudine vix excedentia) membranacea campanulata.

4. ANTHOCERUS VENOSUS, Lindenb. et G.

Syn. Hep. 584; Gotts. Mex. Leverm.

Hab. Tarapoto, Andium Peruviæ, in rivuli arena. Mexico (LIEBMAN).

Involucre 2·0 × 0·6; *pedicel* 9·0; *capsule* 10·0 × ·25; *elaters* ·15; *sporæ* $\frac{1}{40}$–$\frac{1}{30}$ mm.

Pusilla viridis, siccando nigrescens. Frons prostrata suborbicularis, diametro 1–2cm, radiatim divisæ, divisionibus obovato-oblongis rotundato-lobulatis, medio sulcâ exaratis, necnon inter lobulos sulcatis, quasi utrinque depresso-2-3-venosis, inter venas bullatis et lineari-punctatis; costa lata, cum pagina utrinque confluens, medio 6-8 cell. crassa, subtus longe radicellosa; cellulæ paginæ mediocres, marginales 2-stratæ, costam versus 3–5-stratæ, strati supremi nucleatæ, internæ sæpius vacuæ.

Flores monoici: ♀ antici, e lobis apicem versus orti. Involucrum breve cylindraceum, inferne 6–8 cell. crassum, ore truncato scariosum subintegrum. Pedicellus alte exsertus. Capsula badia, involucro 5plo longior, tenuis, obtusa, bivalvis, columella tenui. Elateres breves plani, raro torti, vix unquam subspirales. Sporæ pro genere parvæ, angulari-globosæ, minute scaberulæ.

Var. *macrocarpa*. *Involucre* 3·5; *capsule cum pedicel* 40; *elaters* ·25–·3 mm. Paulo robustior, frondis divisionibus sæpe subpinnatis vel ex parte dichotomis, laciniis brevibus latis crenato-lobulatis, sulcato-venosa, inter venas valde convexa, subrotundo-punctata, strato hypodermi subcavernoso. Pedicellus capsulaque sæpe longissimi. Elateres longiores, flexuosi, haud spirales. Sporæ sublævissimæ—*M. Guayrapurina*.

Var. *brachyscypha*. *Involucre* 1·0–1·6 × 0·9; *capsule+pedicel* 10–17 × 0·4; *sporæ* $\frac{1}{30}$ mm. Pusilla, late imbricata, floribunda, divisionibus canaliculatis—quasi depresso-nervatis—venis lateralibus autem nullis; costa (=$\frac{1}{3}$ frondis lat.) sæpe bene distincta, a pagina utrinque subabrupte divisa. Involucra perbrevia, ovato-cylindrica.—*Baños* Andium Quitensium.

5. ANTHOCEROS PICHINCHENSIS, Spruce.

Hab. In rivuli saxis montis *Pichincha*.

Involucre 2–3 × 1·1; *capsule+pedicel* 30 mm.

A. venoso subsimilis distat florescentia dioica; fronde plana (nec sulcato-venosa) profunde pinnatifido-lobata, lobis sæpe assurgentibus, pinnatis, medio 6 cellulas crassis. Elateres breves geniculati, sæpe fragmentarii. Sporæ minutæ, scaberulæ.

NOTOTHYLAS, Sull.

Musc. Allegh. (1846). *Carpolipum* Nees, Syn. Hep.

Ab *Anthocerote* differt capsula subsessili, vix ultra involucrum apice paulo emersa, fusiformi vel ovato-oblonga, sæpe in fragmenta transversim dehiscente; elateribus haud spiralibus, geniculatis, pedetentim disruptis. ["Utriculi matricales monospermi" dicit cl. Nees, an recte?]—Melius forsan pro *Anthocerotis* subgenere habenda.

1. NOTOTHYLAS AMAZONICA, Spruce.

Hab. in solo limoso sylvarum prope *Tarapoto*, ad Andium radices, necnon in fluvii *Ramos*, flum. Amazonum tributarii, ripis.

Frondis radius 15·0^{mm}; *cellulæ* $\frac{1}{20}$; *involi* 3·0; *capsula* 3·5 × ·7; *sporæ* $\frac{1}{28}$—$\frac{1}{25}$^{mm}.

Frondes orbiculares subplanæ virescentes, radicellis brevibus matrici arcte adnatæ, profunde lobatæ, lobis subimbricatis crenatis, medio sparse setulosis, tenues, intus hic illic gonidia viridia monstrantes; cellulæ bistratæ majusculæ subconformes.

Involucra loborum axi insidentia, alia basi alia apici proxima, corniformia, basi paulo latiora, depressa fere horizontalia, apice scarioso clausa demum rupta. Capsula basi bulbosa fere sessilis, cylindrico-fusiformis, decurvula, flavida, bivalvis, valvulis margine indistincte coloratis, inferne cellulis elongatis 3–5-stratis conflata. Columellæ nulla vestigia invenire potui. Sporæ magnæ fusco-luteæ angulato-rotundæ. Elaterum frustula pallida subquadrata amorphave.

Obs. Planta ad fl. *Ramos* lecta duplo minor est, parce fructifera, capsulis autem sporisque typo conformibus. In utraque forma columellam frustra quæsivi. Columellæ absentia e capsulis supramaturis probabiliter evenit, ejus residua forsan cum elaterum frustulis mixta et confusa e capsulâ ruptâ simul ejecta.

N. valvata Sulliv. in 'Musci Allegh.' no. 289, a nostra ægre distincta, differt statura minore; capsulis infra medium paulo latioribus, ovato-cylindricis, superne late obtuse subulatis; columella lata utrinque appendiculata; sporis pallidis. *N. melanospora* ejusd., quoad columellam vix diversa, specifice differre haud videtur.

ERRATA.

Page	3,	line	3, *for* "innovatis pes" *read* "innovationes."
,,	15,	,,	18, *for* "ad breviotis" *read* "abbreviatis."
,,	21,	,,	8 from foot, *for* "*Jamesoni*" *read* "*viminicola.*"
,,	23,	,,	24 from top, *for* "marginata" *read* "emarginata."
,,	24,	,,	14 from top, *for* "$\frac{2}{3}$" *read* "$\frac{1}{3}$."
,,	47,	,,	3 from foot, *for* "folia" *read* "foliola."
,,	59,	,,	12 from top, *for* "caulo" *read* "caule."
,,	61,	,,	13 from top, *for* "super" *read* "rupes."
,,	68,	,,	20 from top, *for* "were" *read* "are."
,,	109,	,,	20 from top, *for* "Caudex" *read* "Caules."
,,	127,	,,	9 from top, *for* "Flora" *read* "Folia."
,,	128,	,,	7 from top, *for* "pilum" *read* "hilum."
,,	129,	,,	8 from foot, *for* "medio" *read* "dimidio."
,,	147,	,,	10 from foot, *add* "(Tab. xxi.)."
,,	157,	,,	8 from top, *for* "*temnantha*" *read* "*cuneiflora.*"*
,,	170,	,,	14 from top, *for* "3" *read* "6."
,,	170,	,,	17 from top, *for* "*uncinata*" *read* "*aneistrode.*"
,,	184,	,,	7 from foot, *for* "quam" *read* "quum."
,,	187,	,,	11 from top, *for* "palmata" *read* "palmifolia."
,,	196,	,,	5 from top, *for* "*ligulata*" *read* "*obfuscata.*"*
,,	204,	,,	6 from top, *for* "*Lejeuneæ*" *read* "*Lejeunea.*"
,,	210,	,,	10 from foot, *after* "♂" *add* "et ♀ fertilis."
,,	224,	,,	9 from foot, *for* "*apiculata* S." *read* "*subsimplex* Mont."
,,	236,	,,	16 from foot, *add* "(Tab. ix.)."
,,	239,	,,	7 from foot, *erase* "(Tab. ix.)."
,,	240,	,,	24 from top, *for* "*implexa*" *read* "*Rionegrensis.*"*
,,	262,	,,	20 from foot, *for* "*Sinelarii*" *read* "*Sinclairii.*"
,,	305,	,,	12 from top, *add* "(Tab. xxii.)."
Pages	306, 307,		308 at top, *for* "Colo-Lejeunea" *read* "Myriocolea."
Page	309,	line	6 from top, *after* "caule" *add* "solum."
,,	321,	,,	5 from foot, *for* "prepauca" *read* "perpauca."
,,	357,	,,	15 from foot, *for* "spinosa" *read* "spinosæ."
,,	367,	,,	3 from foot, *after* "subobtusi" *insert* "dispiri."
,,	381,	,,	6 from top, *for* "bastatim" *read* "hastatim."
,,	415,	,,	4 from foot, *for* "autem" *read* "stantem."
,,	415,	,,	8 from foot, *for* "Calyptra" *read* "Capsula."
,,	557,	,,	14 and 18 from foot, *for* "hypogynæ" *read* "hypogenæ."

* Three specific names of *Lejeuneæ* occur in duplicate in the text, and one of each pair should be replaced by the corresponding name marked above with an asterisk. After the genus had been partially worked up, an interval of ten years passed ere the author resumed his labours on it; hence his obliviousness of certain names previously made use of.

INDEX.

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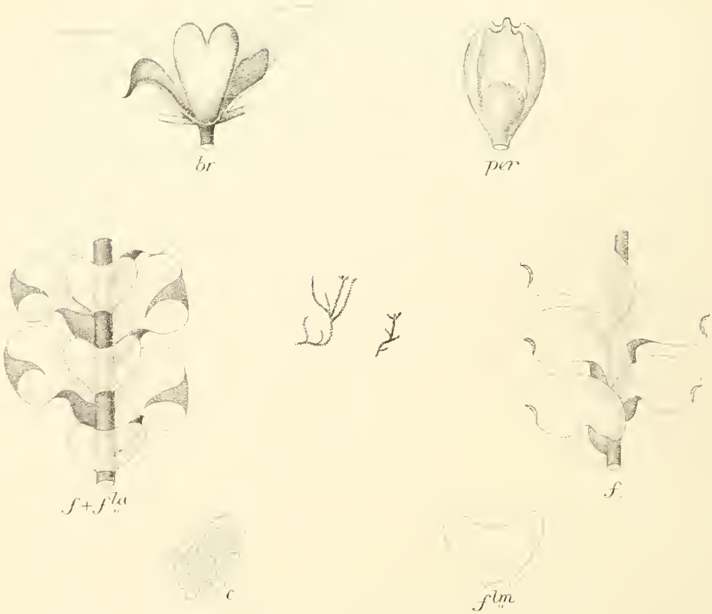
* To those who are familiar with the general structure of hepaticæ the figures mostly explain themselves. The abbreviated names of some of the organs depicted are the same as those that precede each specific description in the text, viz., *r.* = *ramus*; *f.* = *folium* or *folia*; *f.c.* = *folium caulinum*; *f.r.* = *folium ramеum*; f^{la} *foliola*; *c.* = *cellulæ*; *fl.* = *flos* or *florescentia*; *inv.* = *involucrum*; *br.* = *bractea involucralis*; br^{la} = *bracteola*; *p.* or *per.* = *perianthium*; *cal.* = *calyptra*; *caps.* = *capsula*; *el.* = *elater*; *sp.* = *sporæ*. As the dimensions of the organs are given in the text, it will be seen, by comparing them with the corresponding figures, how much the latter are magnified. The central figure on each plate usually represents an entire plant the natural size; only on the last two plates the unmagnified figure is at top.



HARPALEJEUNEA ANCISTRODES.

Mintern Bros imp.

HARPALEJEUNEA ASPRELLA

R Braithwaite ad nat del E Carter sc

Mintern Bros imp

TRACHYLEJEUNEA ACANTHINA

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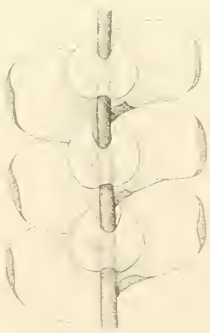
per + inv

br ♀

per sect

br la

f lm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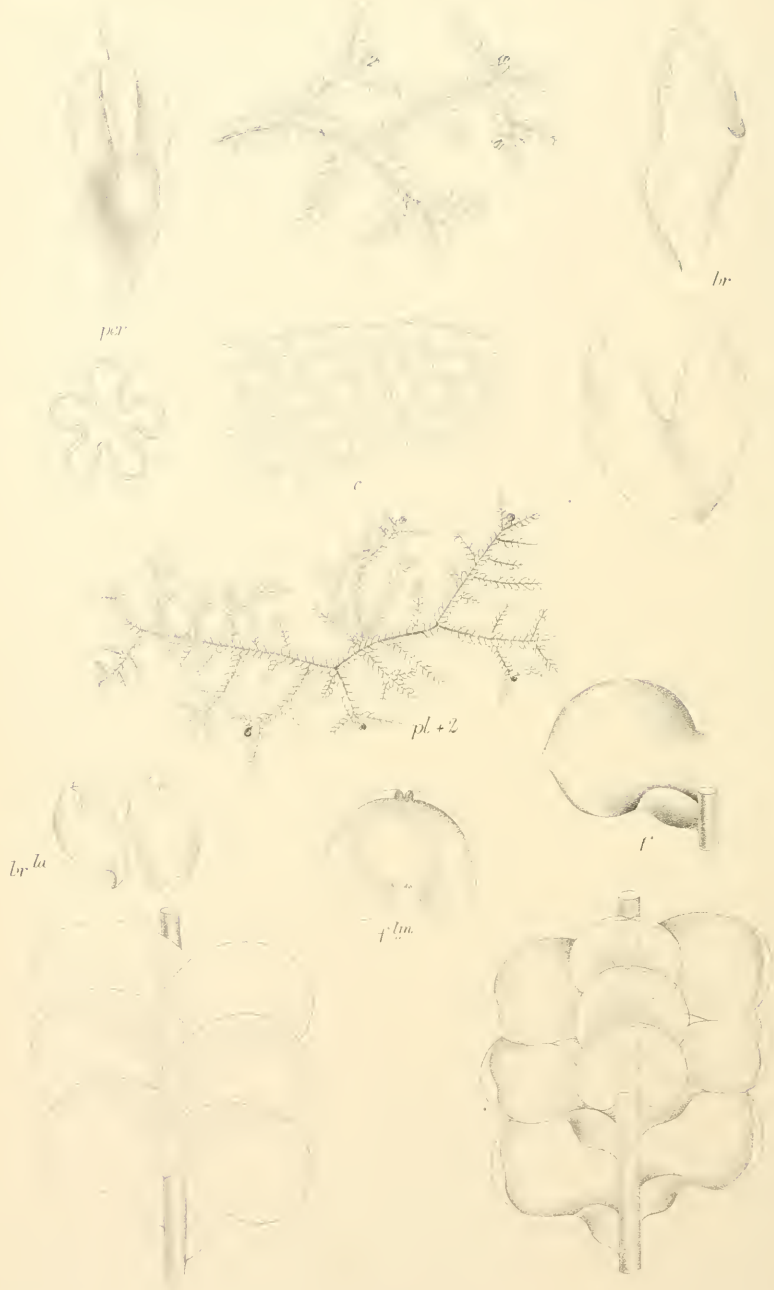
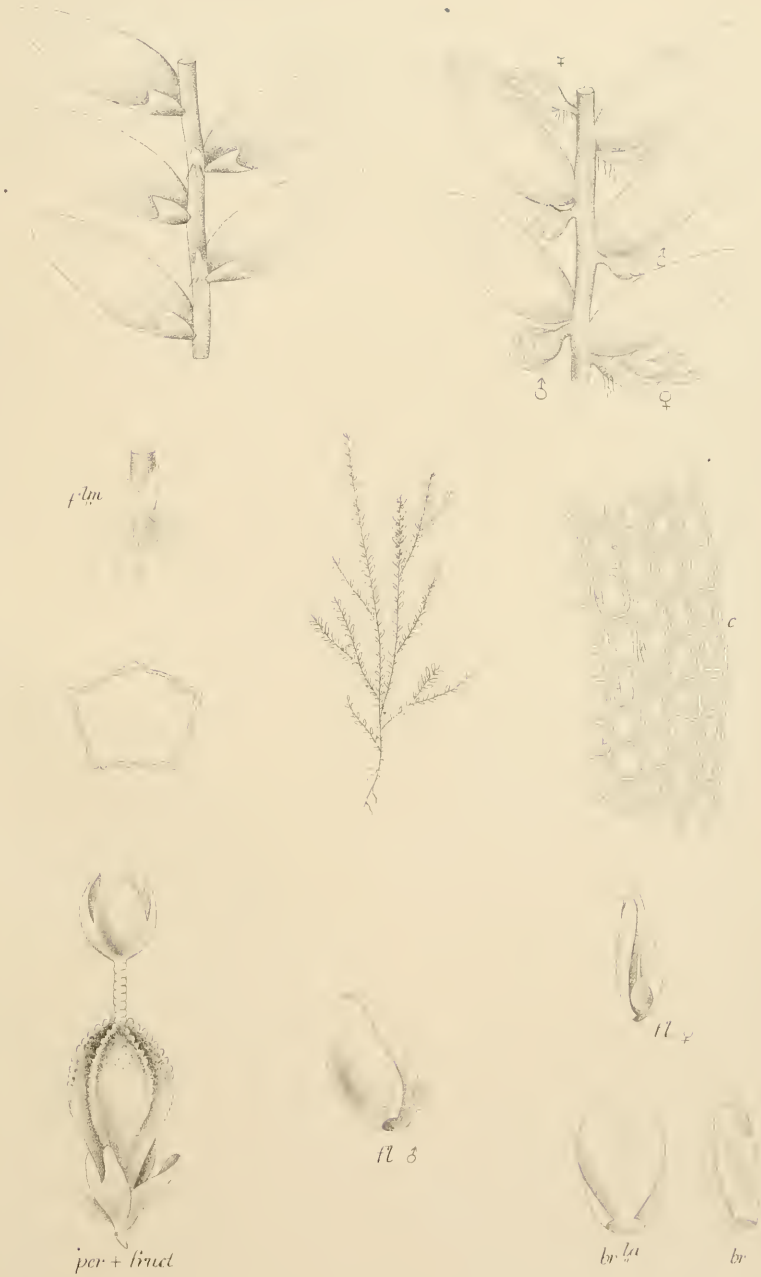
CERATOLEJEUNEA MICRORHEGMA



HYGROLEJEUNEA DEVOLUTA



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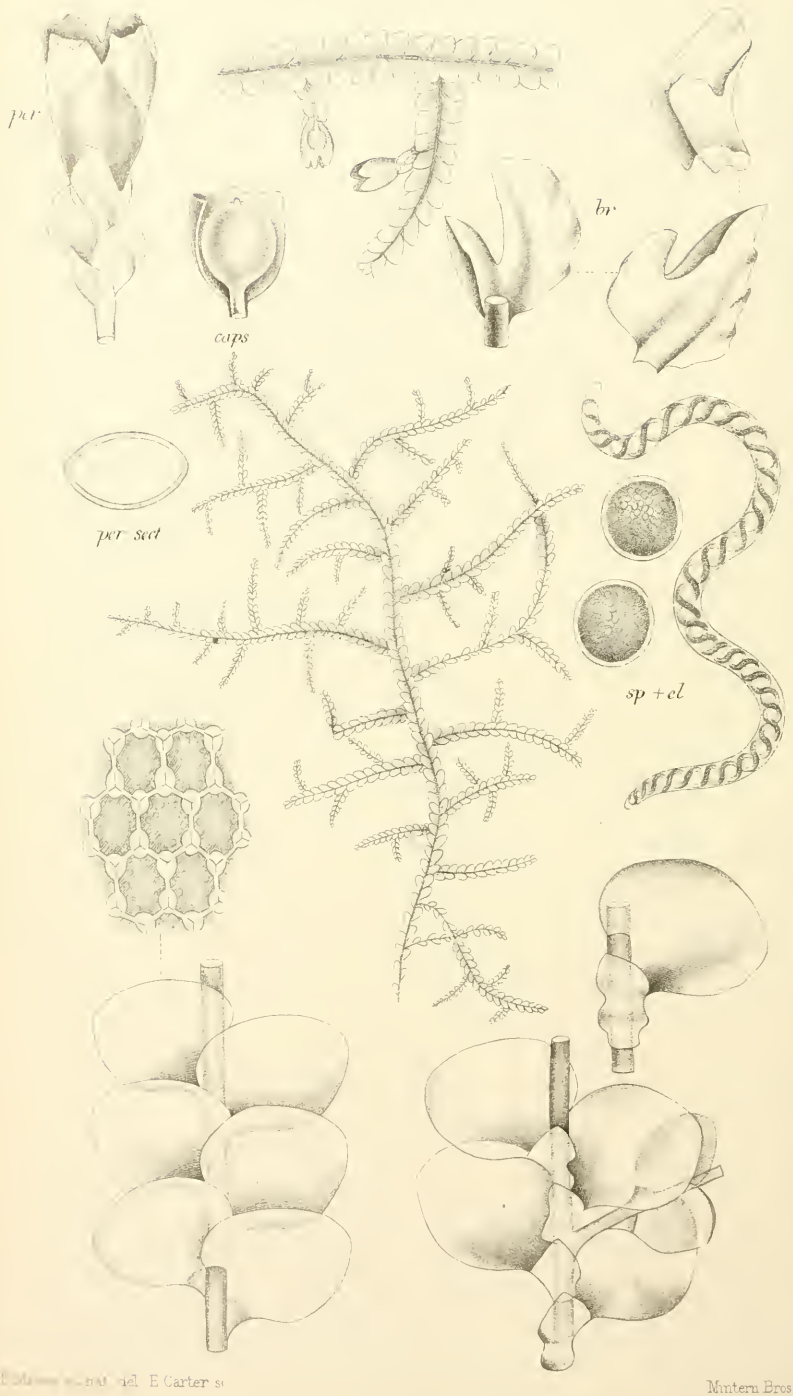
EULEJEUNEA INUNDATA var FONTINALOIDES



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RADULA GOTTSCHEANA.

per

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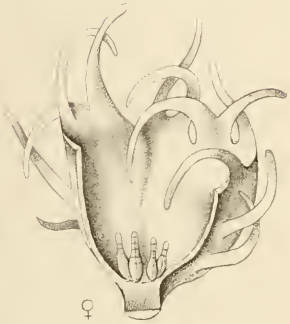

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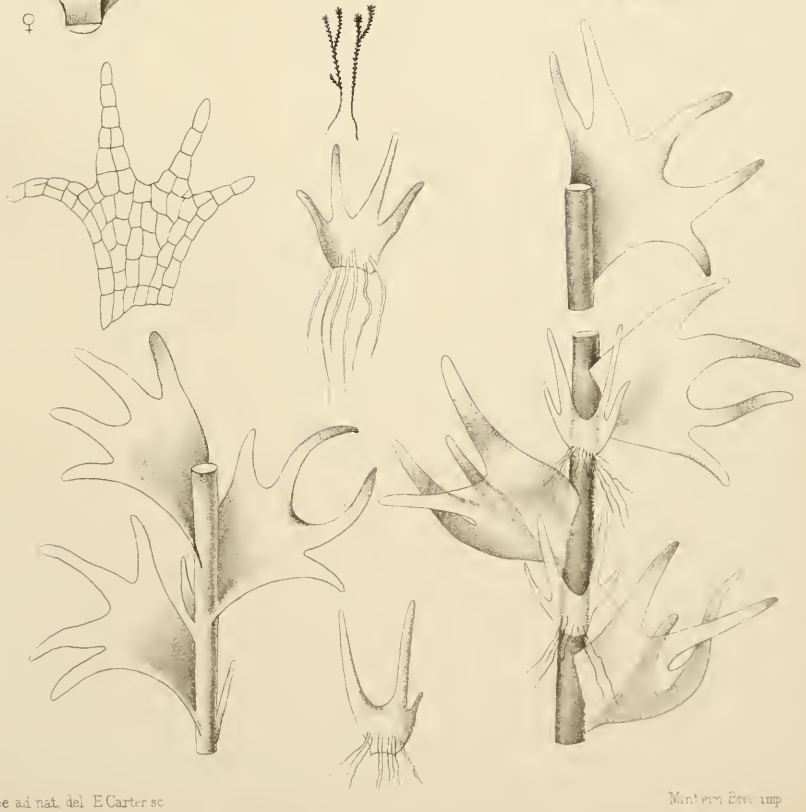

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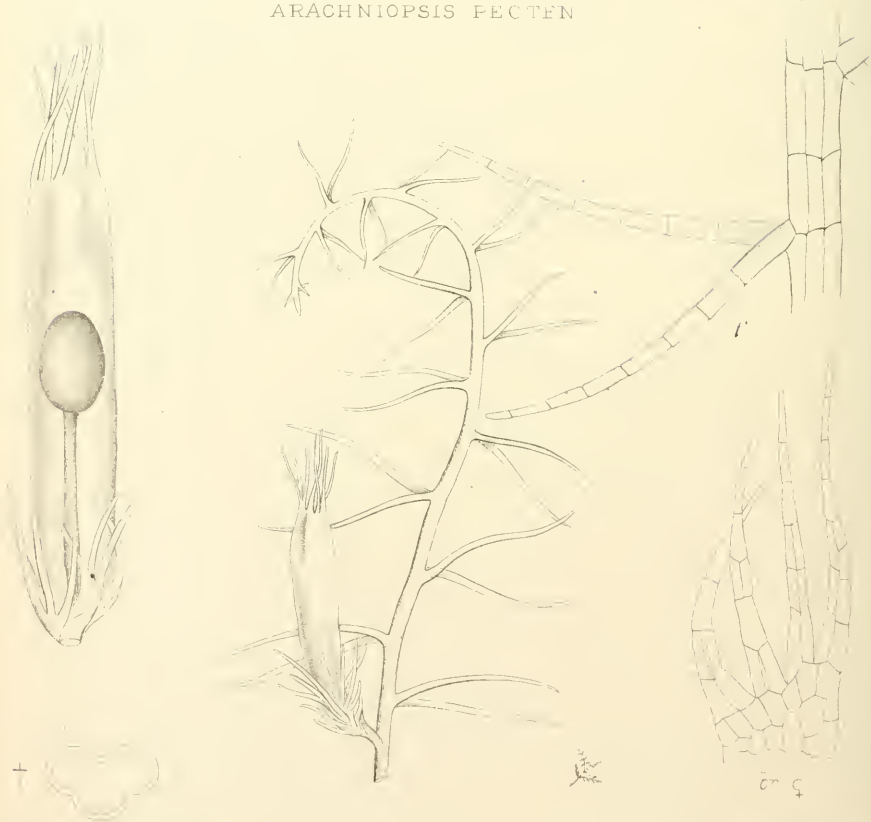
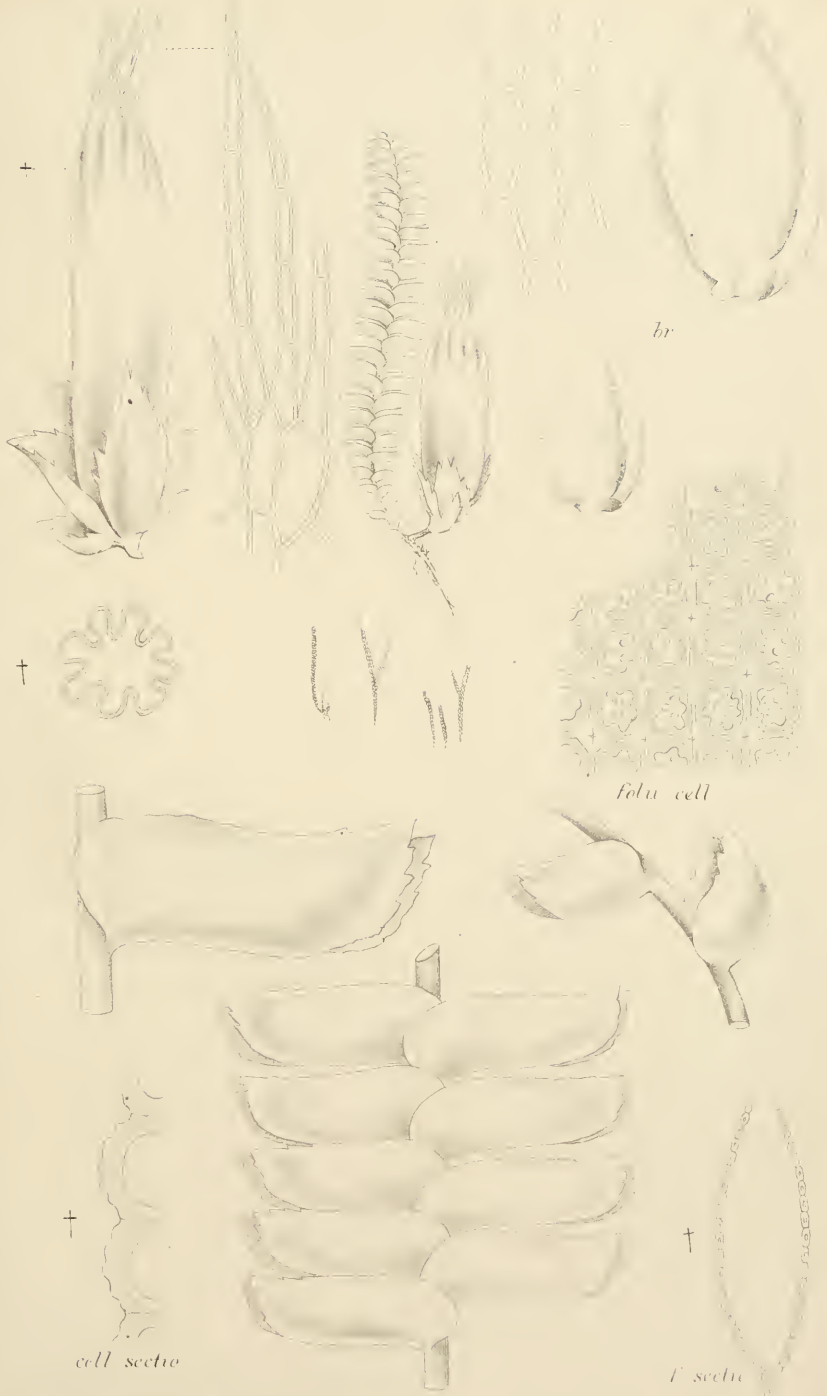
CHÆTOCOLEA PALMATA

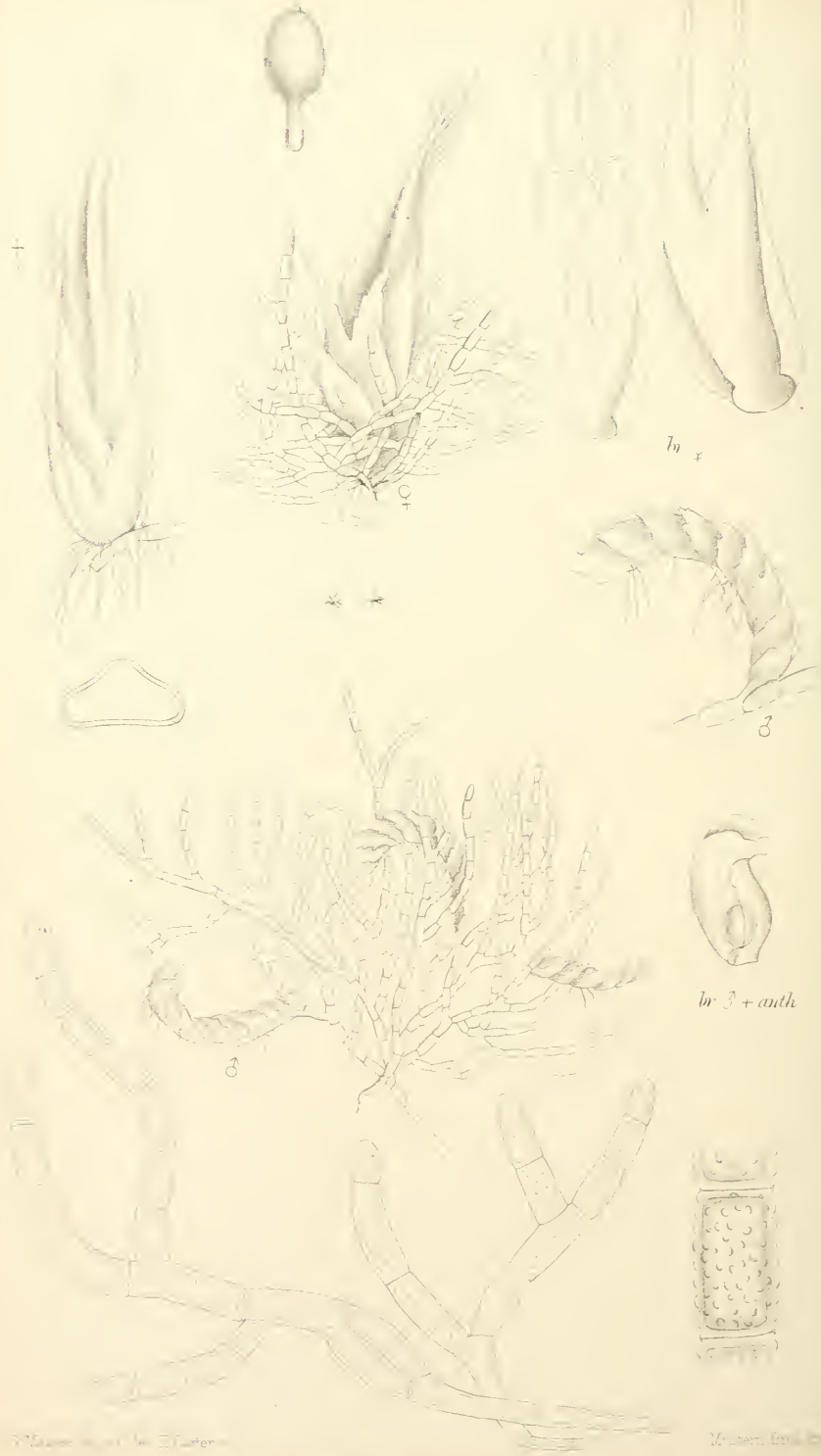
ARACHNIOPSIS PECTEN



ARACHNITOPSIS COACTILIS



MYTILOPSIS ALBIFRONS.



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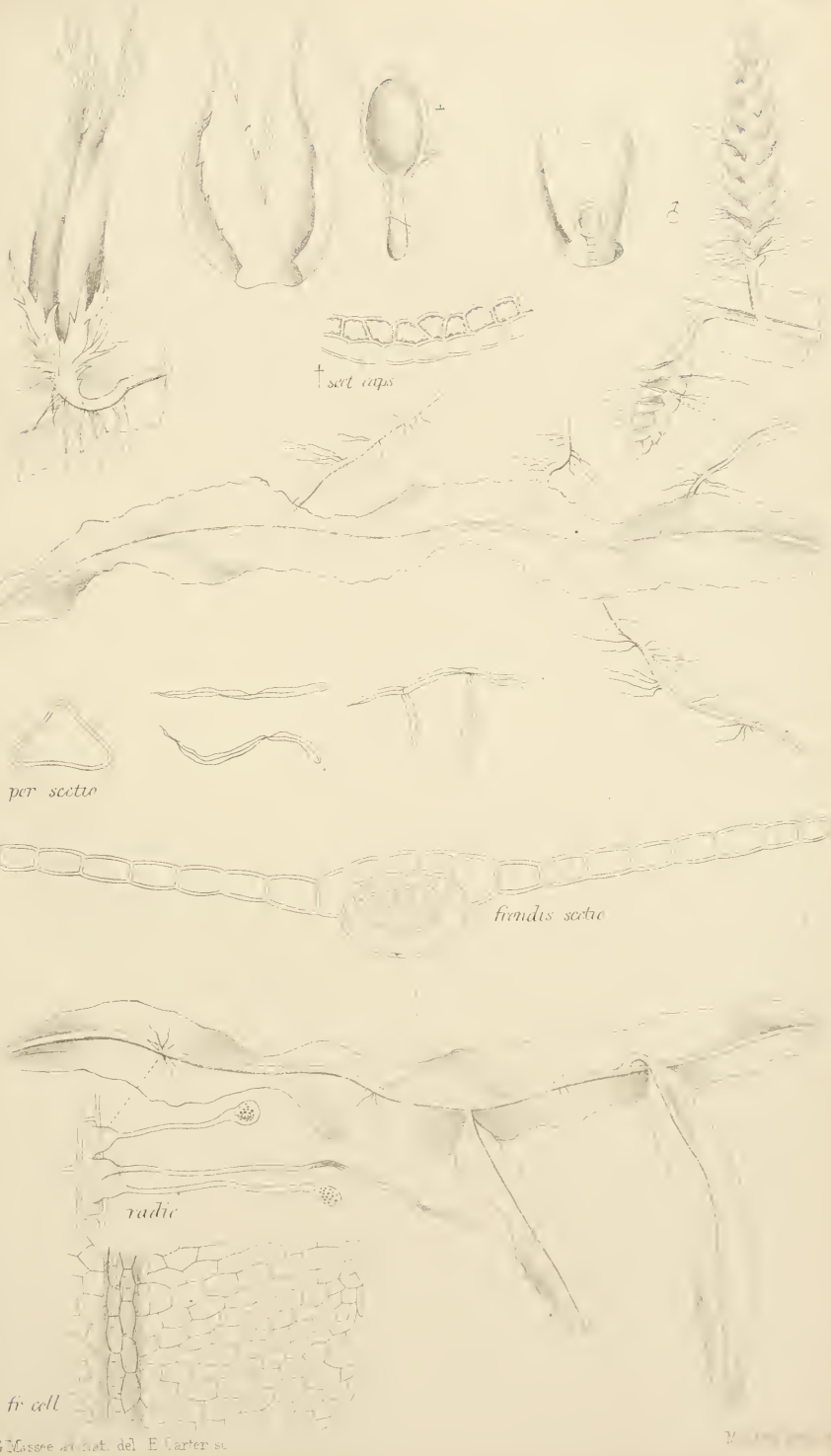

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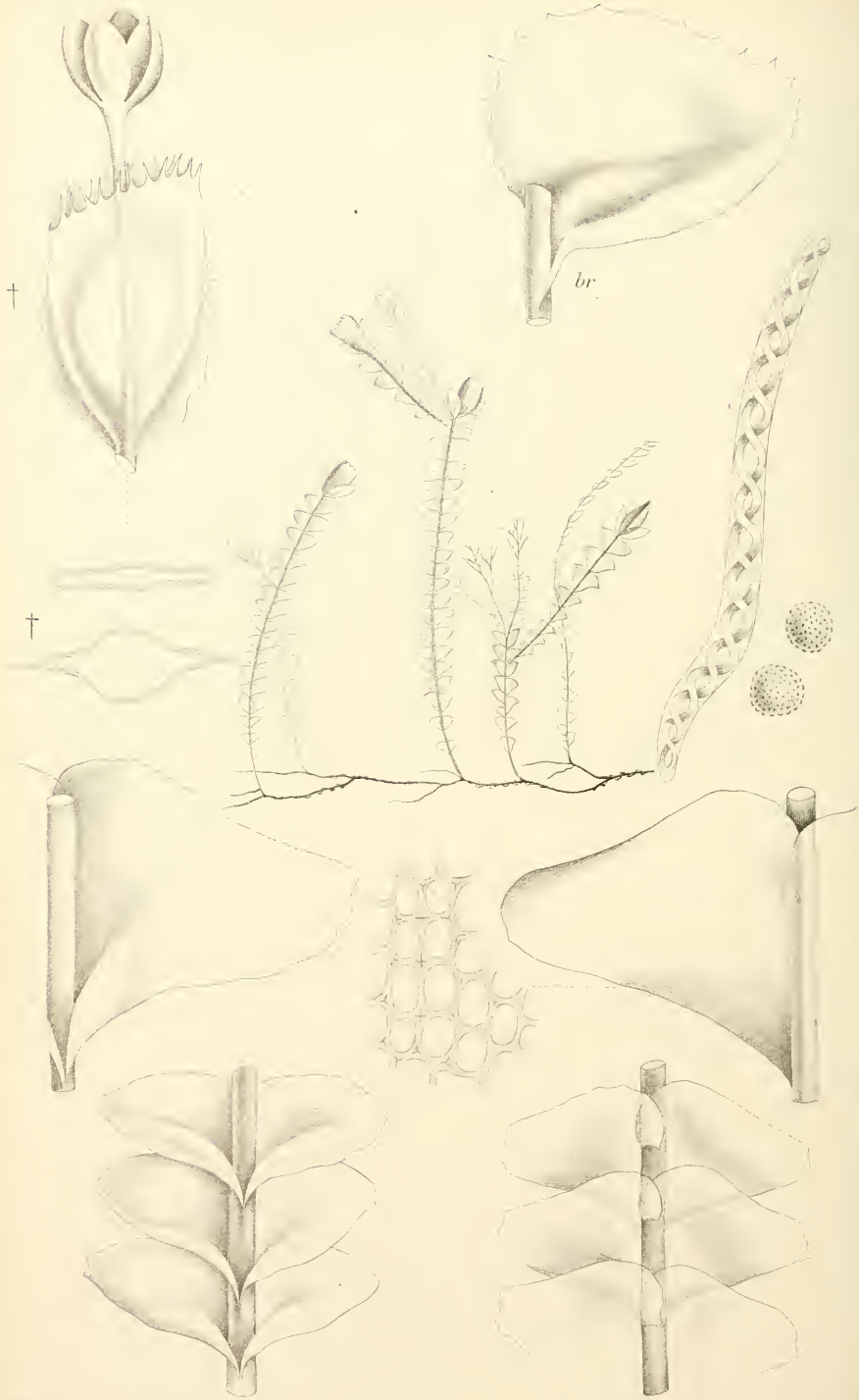

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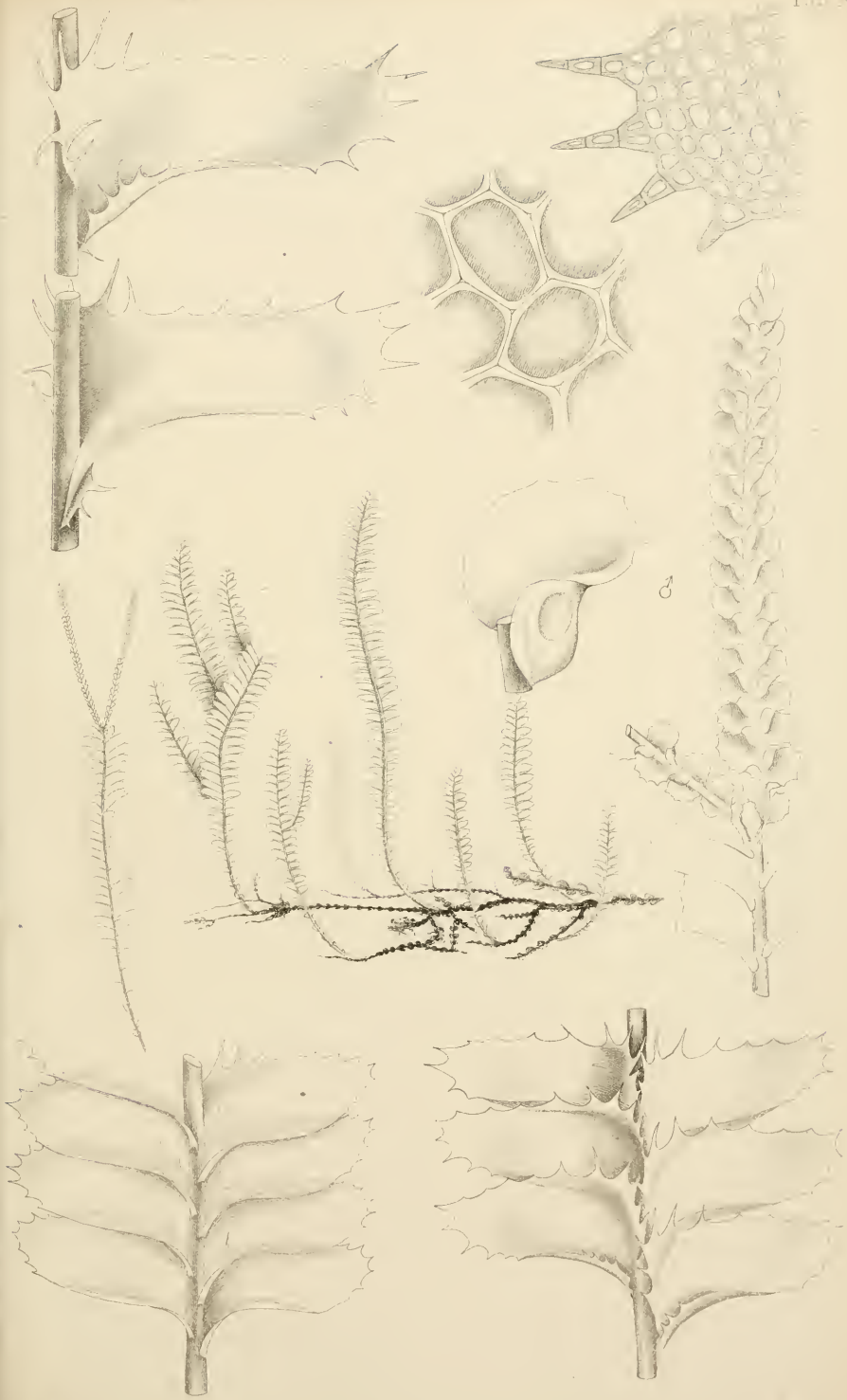

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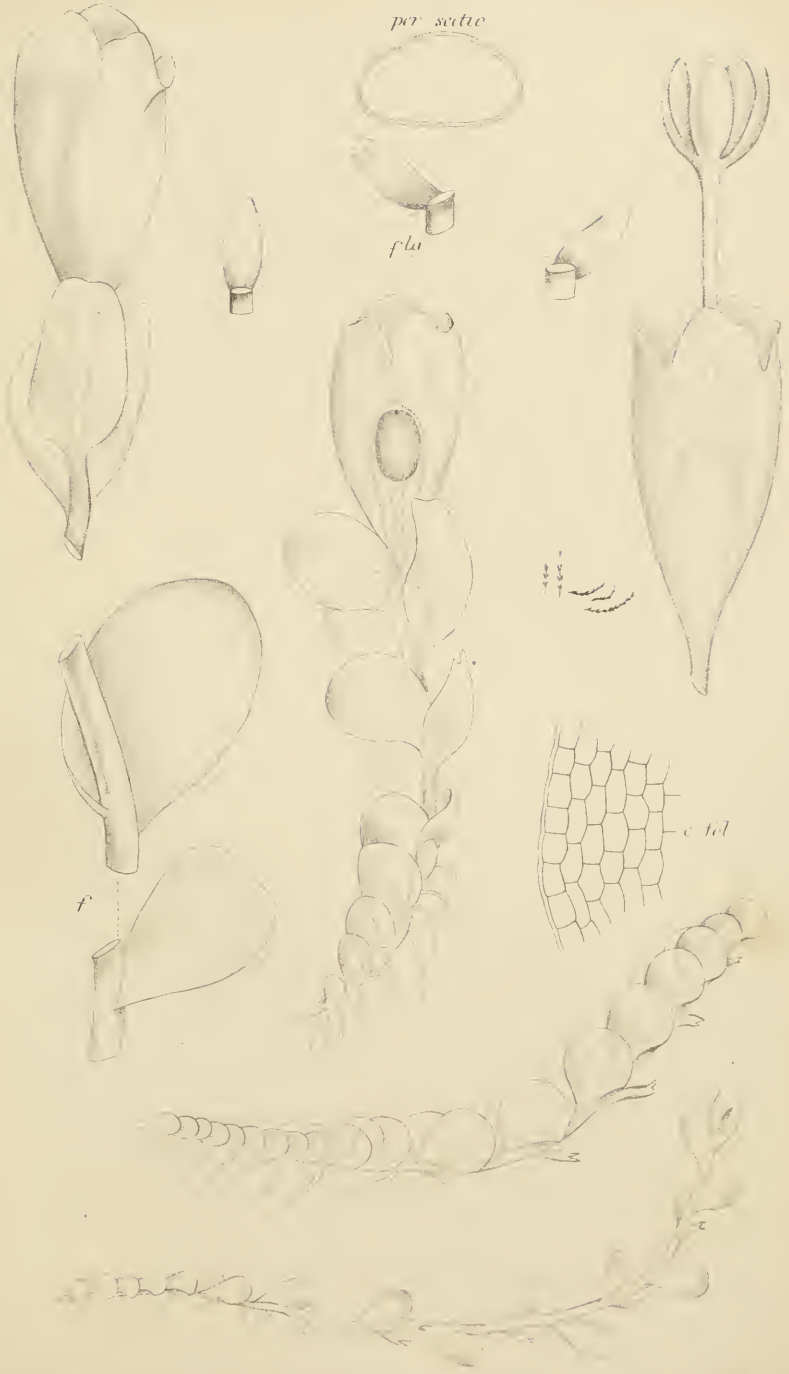
ANEURA CILIATA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